The Builder.

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ILLUSTRATIONS.

United Kingdom Provident Institution, Strand, W.C. } .....Mr. H. T. Hare, F.R.I.B.A., Architect.
Detail of Entrance, United Kingdom Provident Institution }
Bas-Relief Figures, United Kingdom Provident Institution.....Mr. F. E. E. Schenck, Sculptor.
Wrought-Iron Gates, Chiswick.....Measured and Drawn by Mr. Maurice S. Adams.

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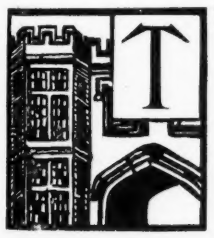
The Annual of the British School at Athens.



HE twelfth number of this interesting publication* is up to the best traditions in point of bulkiness, and, it may also be said, is fully as well equipped as any other number in the most recent phase of its editing. The days of what might be called the middle period of the "Annual" are over. Dr. Evans has ceased to publish the long reports on Knossos which were such a feature a few years ago. In those days the volume consisted, firstly, and very largely, of Knossos; secondly, of the School-work proper, which was then in Crete; and, lastly, of one or two short occasional papers of a lighter character. Nowadays, the tendency is to multiply the number of occasional papers, so that the present volume, which may be considered typical, contains sixteen of them before the work proper of the School in Laconia is set down. Thus the title of one of these papers—"Notes from the Sporades"—becomes eloquent of a phase in the volume. We call it a phase because at any time some overmastering work in Laconia, or a change of Directorship, might lead to a change in the character of the official publication of a body which, it must be borne in mind, is served for the most part by a stream of men constantly passing across the field of research and then disappearing. It is inevitable, then, that there cannot easily be a continuous tradition in the character of the volume. In many ways, perhaps, this is as well, but if a word of criticism might be offered on the present tendency, one would suggest that more coherence be given to the occasional papers by bringing them under some form of classified headings, and that the work of the School proper be set down first in the volume, thus avoiding an appearance of secondary importance in what is, after all, the recognised programme of the School in a given year. Doubtless the best way to classify the occasional papers would be to reserve all those of a class for one volume, keeping them with this end in view perhaps for some years; but we can quite see the difficulty of this, and understand the wish, which all archæologists have, of getting into print as soon as possible.

The most important of what we have called the occasional papers in the present volume is the second part (continued from last year's "Annual") of Dr. Mackenzie's "Cretan Palaces and the Ægean Civilisation." If the first part was of more interest architecturally, the second should be more taken up by the average archæologists interested in the prehistoric field. The architectural evidence of the Cretan palaces is indeed brought forward at the conclusion of the article in a consideration of the *megaron* as found on the mainland and in Crete, with special reference to the fixed hearth found in the former type but not in the latter; but the greater part of the article deals with the development of Ægean dress, as illustrated by Cretan finds. Dr. Mackenzie's argument is to be continued in a future number, so that a link may even yet be formed between Dr. Evans's first Reports and the account of his latest surprising discoveries at Knossos, which it is reasonable to suppose may appear in the "Annual" a year or two hence.

The occasional papers are not altogether devoid of architectural interest. Mr. Hasluck follows his particular bent in topographical research, and contributes an article which should be most useful for reference purposes on "MSS. in the British Museum Relating to Levant Geography and Travel." He illustrates in the text a map of Chios, of 1677, and in Plate I., XVth century maps of Crete and Constantinople, the latter, in particular, being of great interest. Mr. Hasluck also publishes a hitherto unrecorded Roman bridge on the Aesepus, near Cyzicus, which he illustrates by a small elevation (lacking a scale, by the way) and some photographic views.

Another article of architectural interest is that by Mr. H. J. W. Tillyard on "Two Watch-towers in the Megarid," an illustrated description of one square and one round tower. The square tower, illustrated by a photo on page 102, is a fine upstanding piece of masonry, built of large rough squared blocks with drafted edges, and measuring some 17 ft. square. The round tower is evidently of later work.

Mr. J. P. Droop contributes a considerable paper on "Some Geometric

* "The Annual of the British School at Athens." No. xii., Session 1905–1906. Printed for the subscribers and sold on their behalf by Macmillan & Co. 25s. net.

Pottery from Crete," fairly well illustrated as regards detail, and containing one fine piece of relief work—the bottom of a dish, illustrated on page 38. Although the earlier publications of Mycenæan vases illustrated geometric pottery in profusion, this kind of ware has not yet received the attention it deserves. It was a decadent craft in truth, but some remarkably fine pieces occasionally appear, and Crete was rich in them.

Mr. S. Xanthoudides, of the Candia Museum, writes on "Cretan Kernoi" (the small cups containing first-fruits anciently carried in religious processions), and sufficiently illustrates how Greek lands belong in some measure to the "changeless East" by calling attention to the parallel rite which is practised to-day in the Orthodox Church. The modern kernos, illustrated on page 22, is an interesting piece of furniture.

That the recent work of the School in Crete has still a lingering interest is shown by two articles, the first in the volume, which is a brief account of the final winding-up at Palaikastro by Mr. R. M. Dawkins, the present Director of the School, and another on "Tombs at Præsos," by Mr. F. H. Marshall. The discovery of a woman's skull with silver roundels forming part of a diadem actually affixed to it is of more than ordinary interest.

It is only possible to mention the remaining unclassified articles—Mr. J. L. Stokes on "Stamped Pithos Fragments from Cameiros"; Mr. J. P. Droop on "Dipylon Vases from the Kynosarges Site" and "Messapian Inscriptions"; Mr. Guy Dickins on "Damophon of Messene"; Mr. A. C. B. Brown on "Excavations in Bœotia"; Messrs. R. M. Dawkins and A. J. B. Wace on "Notes from the Sporades"; Messrs. R. M. Dawkins and F. W. Hasluck on "Inscriptions from Bizye"; and Mr. K. T. Frost on "Boats on the Euphrates and Tigris."

The chronicle of the work of the School proper at Laconia, in Sparta, occupies rather less than half the latter part of the volume. There may be some reasons for beginning with the mediæval work, but one would naturally expect the archaic Greek work to come first, and so go on chronologically. Probably one reason is to be found in the comparative importance of the mediæval work in this district. The present Directorship, in common with that just past, encourages the study of Christian remains, and Mr. Ramsay Traquair has for some time been investigating the evidences in Sparta for the School. His present paper, which is illustrated by five plates at the end of the volume, deals with Frankish fortresses principally at Geraki and Monemvasia. These fortresses contained churches, and Mr. Traquair rightly calls attention to the fact that though Byzantine in plan they have much in common, especially in detail, with the South Italian work at Bitonto and elsewhere. The Frankish occupation of the Morea is a very interesting phase of history, and the complete co-ordination of its architecture with the central source is much to be desired. It is to be regretted that Mr. Traquair does not outline the historical aspect more clearly as regards date in his introduction, so as to make the subject more clear to the outside reader, but his descriptions are generally good and his plates are excellent. The careful measured drawing of a niche at Geraki (Plate IV.) shows an interesting piece of work.

Mr. Bosanquet's summary of the season's work follows; then Mr. A. J. B. Wace's investigation of the city wall, illustrating a good find on Plate IX.—part of a good late Greek pithos with fighting warriors in relief. Mr. Dickins's note on the great altar near the Eurotas is followed by Mr. Bosanquet's account of the Sanctuary of Artemis Orthia. It is this sanctuary—the centre of the cult of Artemis, in which Spartan boys were flogged for discipline—which occasioned the finds of inscriptions discussed by Mr. H. J. W. Tillyard in two papers of some length, well illustrated. The cult was of great importance in Sparta, lasting right through Greek into late Roman times, so that inscriptions are numerous. Though late, they are often very fine, as here illustrated on pages 358-376, and again on page 468.

Mr. Traquair contributes a paper on "The Roman Architectural Work," with some good constructional diagrams, and Mr. Dickins, in his paper dealing with the theatre, illustrates a substantial piece of Roman frieze on page 397. Mr. Dickins also contributes a note on "Topographical Conclusions," and Mr. Dawkins an interesting article on the "Archaic Greek Finds," illustrating some capitally-drawn lead figurines.

The plates at the end of the volume, besides those already mentioned, show a useful general plan of Sparta, and a detailed plan of the Artemisium and the Acropolis; also three plates of terra-cotta masks from the Sanctuary, one of them in colour.

The volume is distinctly a good one, and points to a healthy activity in the work of the School. As already suggested more than once, it rather lacks in editing.

MEDIÆVAL CHURCH PLANNING IN ENGLAND.—II.

By FRANCIS BOND, HON.A.R.I.B.A.

FIFTH GROUP; types, Waverley Abbey and Worcester Cathedral.—At this point we come to the parting of the ways in the history of the plan of the eastern limb of the greater English churches. The fourth group of churches, which followed the precedent of Romsey, as well as the first group, which had the periapsidal ambulatory still seen at Gloucester and Norwich, both had their ambulatory *external* to the main eastern wall of the church, and at a much lower level. From this arrangement all the remaining groups of presbyteries departed. None of them had an ambulatory east of the east wall of the presbytery. Their ambulatory was *internal*, *i.e.*, it was west of the main eastern wall of the church, and, being west of it, it was as lofty as the presbytery itself.

Of this type there were two examples even in the XIth century, viz., in Rochester Cathedral, the work of the early years of Gundulph, who was bishop from 1077 to 1108; and Hereford Cathedral, begun by Bishop Robert between 1079 and 1095, and consecrated in 1110.

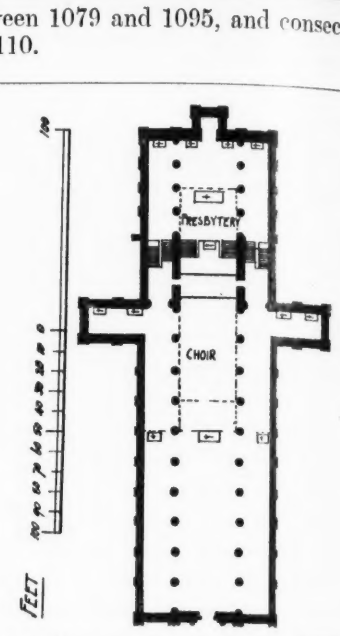


Fig. 12. *Rochester Cathedral* (1108).

The evidence as to Rochester is given in Mr. St. John Hope's "Rochester Cathedral." In 1853 Mr. Ashpitel found a rubble wall upwards of 8 ft. thick crossing the later crypt. In 1881 Mr. Hope discovered that it also crossed the aisles; also that from the middle of this wall there projected eastward the foundations of a small oblong chapel. On this rubble wall must have rested the main eastern wall of the church. The aisles were as long as the presbytery, the presbytery was a rectangular one of four bays, and there projected eastward from it a small oblong chapel. It is a most remarkable plan to find at such an early date, and so utterly different from anything in existence in Normandy, that one can hardly help conjecturing that it followed the traditions of the planning of some of the Anglo-Saxon greater churches.

The other example is from Hereford Cathedral (Fig. 13).

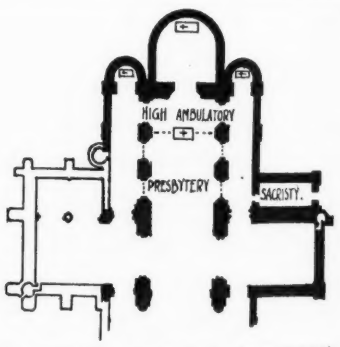


Fig. 13. *Hereford Cathedral* (1110).

Here the presbytery is rectangular, as at Ely, Sherborne, Southwell, and Dover; but there is this great difference, that on the other side of the high east wall of the presbytery there were originally three low chapels. From Sir Gilbert Scott's paper on "Hereford Cathedral" in the *Archæological Journal*, 1877, it appears that these three chapels were apsidal. "The Norman cathedral," he writes, "terminated eastward in an apse, which was a separate and narrow structure opening into the presbytery by an arch of moderate dimensions. Each aisle also terminated in a smaller apse, and each of

the three apses had its own separate roof." Mr. Gordon Hills describes in similar terms the drawings of the excavations made by Dean Merewether in 1868. (*Journal of the Archæological Association*, Vol. XXVII., pages 50 and 497.) So far as Hereford presbytery is rectangular, it connects with the plan of Ely, Sherborne, Southwell, Dover, and Rochester, and Old Sarum; so far as it retains three parallel eastern apses, it connects with the plan of Durham, St. Mary, York, and the rest. But the central apses of Durham, Peterborough, and the others were on a vastly loftier scale than that of Hereford. The former, as may still be seen at Peterborough, was as broad as the presbytery and nearly if not as lofty. That of Hereford was in comparison quite insignificant; it was but little broader and but little loftier than the existing arch which gave access to it from the presbytery. Hereford Cathedral, when first built, and as seen outside from the east, with three tiny apses crouching below the great eastern gable wall of the church, must have looked strangely different from the other triapsal churches of England and Normandy. But, whatever its aspect, it was thought at the time a very clever plan. For William of Malmesbury, who wrote between 1131 and 1148, says of it—"*Aquensem basilicam tereti schemate pro modo suo imitatus*," *i.e.*, "it was neatly planned and was a copy on a reduced scale of a church at Aix." Access was obtained to the central apse from the presbytery by a single semicircular arch,* which still remains; and to the lateral apses by the eastern arches of the choir aisles. What is still more important, the high altar was not placed close up to the eastern arch of the presbytery, but, as Mr. Gordon Hills suggests, one bay west of it. If so, of the three bays of which the eastern limb consists, only the two western bays would form the presbytery. The function of the easternmost bay was twofold. On the one hand, it formed a processional path; on the other hand, it provided access to all three eastern chapels. It follows that what made the plan of Hereford such a "*teres schema*" was that it provided both an ambulatory and three eastern chapels; it was a rectangular equivalent of the semicircular ambulatories and radiating chapels of Gloucester and Norwich. Nevertheless for this a heavy price had to be paid. For the eastern chapels deprived the presbytery of the lower row of eastern windows, for which room was found in the presbyteries of churches of the type of Durham or Ely. Hereford presbytery is and always was very badly lighted from the east. Nevertheless, this plan was a great advance, and the supreme importance of the XIth century presbytery of Hereford in the history of Gothic church-planning has never before been recognised.

It was not, however, till the last quarter of the XIIth century that the Hereford plan found followers. One of the earliest examples is the Cistercian Abbey of Byland in Yorkshire, to which the monks removed in 1177, and in which there is a row of five external rectangular eastern chapels. It has been conjectured by Professor Willis, on not very strong evidence, that the eastern limb of York Minster, as rebuilt by Archbishop Grey, between 1154 and 1181, was arranged as at Byland. In the West of England the examples are numerous. Wells Cathedral must have been rebuilt in this fashion, *c.* 1180; Christ Church, Dublin, about the same time, judging from the foundations, had this plan; Chichester Cathedral, after the fire of 1186; Lichfield Cathedral, probably *c.* 1195; and Worcester, which commenced to rebuild *c.* 1202; Waverley, a Cistercian Abbey in Surrey, rebuilt in 1203; and Hayles, a Cistercian Abbey in Gloucester, rebuilt 1246-1251, have been proved by Mr. Harold Brakspear to have had this same plan. Evidently it was much in favour in the West of England in the last quarter of the XIIth century, and for some time later; the extension at Lichfield is the last example of it.

The following is a list of the churches planned as above:—

	Arches.	Chapels.
Rochester Cathedral—		
Benedictine monks—1077–1108	1	1 (eastern)
Hereford Cathedral—		
Secular canons—begun 1079 to 1095; dedicated 1110 ..	1	3 (eastern)
Byland Abbey—		
Cistercian monks—the monks removed to Byland in 1177 ..	3	5
Dublin, Christ Church Cathedral—		
Arrosian canons—*c.* 1175 ..	? 1	? 3
Wells Cathedral—		
Secular canons—*c.* 1180	?	?
Chichester Cathedral—		
Secular canons—after fire of 1186	1	3
Lichfield Cathedral—		
Secular canons—*c.* 1195 ..	?	?
Worcester Cathedral—		
Benedictine monks—1202–1218	1	3
Waverley Abbey—		
Cistercian monks—begun in 1203	3	5
Evesham Abbey—		
Benedictine monks—1218–1220	3	? 5
Pershore Abbey—		
Benedictine monks—1223–1239	1	3
Hayles Abbey—		
Cistercian monks—1246–1251 ..	3	5
Lichfield Cathedral—		
Secular canons—begun 1310 ..	1	3

At Byland, Hayles, and Waverley (Fig. 14) there was a row of five rectangular chapels, none of which projected beyond the rest.

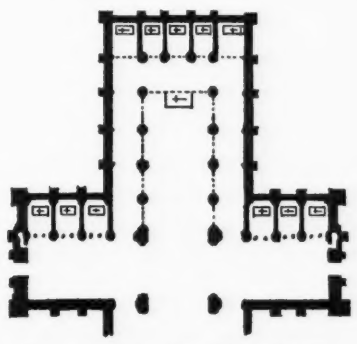


Fig. 14. *Waverley Abbey* (1203).

This may have been because all three, being Cistercian churches dedicated to St. Mary, needed no separate and conspicuous Lady Chapel. It is probable that in the others the central eastern chapel was given greater projection and importance than the rest. In Gundulph's, Rochester, in the opinion of Mr. Hope, the solitary eastern chapel was probably the chapel of St. Paulinus. At Hereford it may have been the chapel of the patron saint of the church, St. Ethelbert. But as the veneration of the Blessed Virgin increased in the later years of the XIIth century and in the XIIIth, the tendency was more and more to use the projecting eastern chapel as Lady Chapel.

Chichester and Worcester alone have a double ambulatory. Of all the churches in the group Worcester is the noblest. All the rest have a range of low eastern chapels or a low central Lady Chapel, but at Worcester the vaults and roofs

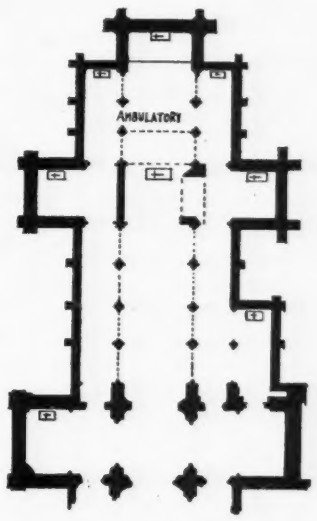


Fig. 15. *Worcester Cathedral.*

of choir and presbytery continue in undiminished height and breadth to the extreme east end of the Lady Chapel. At Lichfield, also, as finally remodelled, the great eastern Lady Chapel is nearly as lofty as the presbytery. As regards geographical distribution most, as was to be expected, are in the West of England, for they are closely akin to the churches of the Romsey type. To the north belongs Byland; to the East of England none; to the south Chichester and Waverley; to the west belong Hereford, Christ Church, Dublin, Wells, Lichfield, Worcester, Pershore, Evesham, and Hayles. All except Worcester must be regarded as unsatisfactory, for their eastern chapels rob the presbytery of much of its light. At Worcester the great height of the Lady Chapel and its very inconsiderable projection—it projects barely one bay—give an abundance of eastern light from close at hand. Worcester gives an adequate solution of the problem; it provides plenty of light, plenty of chapels, and an ambulatory.

Sixth group; type, York Minster.—The final group includes those churches in which the eastern limb is simply an aisled parallelogram. Structurally, ambulatory and eastern chapels have disappeared; the aisles are as long as the choir and presbytery, but do not return round the latter. In the first Hereford Cathedral we saw that an internal ambulatory was probably obtained by simply moving the high altar one bay west of the east wall of the presbytery. At Hereford the eastern chapels were outside this wall. Obviously, however, if the high altar were moved two or more bays to the west, the eastern chapels, as well as the ambulatory, could be brought inside the east wall of the presbytery. And this was the simple plan which in the end found most favour of all, and which made the greater English churches look more unlike than ever to their Continental rivals.

The following is a list of the chief surviving examples; in the last column

* In Llandaff Cathedral also the Norman presbytery is rectangular, and its eastern wall is pierced by a single Norman arch, but this presbytery had no aisles.

is given the number of bays in the eastern limb :—

	Bays.
Salisbury (Old Sarum) Cathedral—	
Secular canons—1115-1139	4
Winchester, St. Cross—	
Hospital church—*c.* 1165..	2
New Shoreham—	
? Secular canons—*c.* 1175..	5
St. David's Cathedral—	
Secular canons—1180 or 1220	4
Jervaulx Abbey—	
Cistercian monks—*c.* 1180	4
Portsmouth—	
Austin canons—*c.* 1185 ..	? 3
West Langdon—	
Premonstratensian canons —founded in 1192, but aisles may have been added later	?3
Hexham—	
Austin canons—*c.* 1195 ..	6
Whitby—	
Benedictine monks—*c.* 1200	7
Coverham—	
Premonstratensian monks —1212..	—
Kirkham—	
Austin canons—*c.* 1220 ..	8
? Bridlington—	
Austin canons—*c.* 1225 ..	—
Rievaulx—	
Cistercian monks—*c.* 1230	7
Boxgrove—	
Benedictine monks—*c.* 1235	8
Netley—	
Cistercian monks—1239 ..	4
Ely Cathedral—	
Benedictine monks—*c.* 1240	9
London, St. Paul's—	
Secular canons—*c.* 1240 ..	12
Lincoln Cathedral—	
Secular canons—1256..	10
Thornton—	
Austin canons—1264..	8
Tintern—	
Cistercian monks—1269	4
York, St. Mary's Abbey—	
Benedictine monks—1271..	8
Selby Abbey—	
Benedictine monks—1280-1300	7
Guisborough—	
Austin canons—*c.* 1289	?
Ripon—	
Secular canons—*c.* 1290..	6
Howden—	
Secular canons—*c.* 1320	6
Carlisle Cathedral—	
Austin canons—*c.* 1340	8
York Cathedral—	
Secular canons—1361	9
Sallay or Sawley Abbey—	
Cistercian monks—probably XVth century..	—
Windsor, St. George's Chapel—	
Secular canons—*c.* 1500	6
Bath Abbey—	
Benedictine monks—*c.* 1500	3
Neath—	
Cistercian	?

The earliest example of this plan is Salisbury Cathedral (Old Sarum), as to which William of Malmesbury, who was, a contemporary says, "Roger, Bishop of Salisbury (1115-1139), built anew the church of Salisbury, and beautified it in such a manner that yields to none in England, but surpasses many." (*Gestis Reg. Angl.*, Liber V., s. 408.) "Its foundations were distinctly visible through the grass in 1834, a very dry year, and, a plan of them was drawn by Mr. Thatcher." This was reproduced in the *Gentlemen's Magazine* for August, 1835, and, in a revised form, in the *Ecclesiologist*, Vol. VII., 60, which remarks that "the general form of the church and the number and position of the pillars rest upon sufficient evidence." The evidence is hardly conclusive; the matter could be settled by a few excavations. But the fact that the next example is the hospital church of St. Cross, Winchester, *c.* 1165, which is not very far away, adds some probability. It is hardly likely that such a great innovation in plan should have arisen first in such a small church as St. Cross. Not far away is New Shoreham, whose eastern limb Mr. Edmund Sharpe believed to be *c.* 1175, and St. Thomas, Portsmouth, *c.* 1185. Far away in the west St. David's Cathedral was built with an eastern limb of four bays, to which an external ambulatory was not added till later days. But it was in the North of England that the aisleless parallelogram struck deepest root. Jervaulx was set

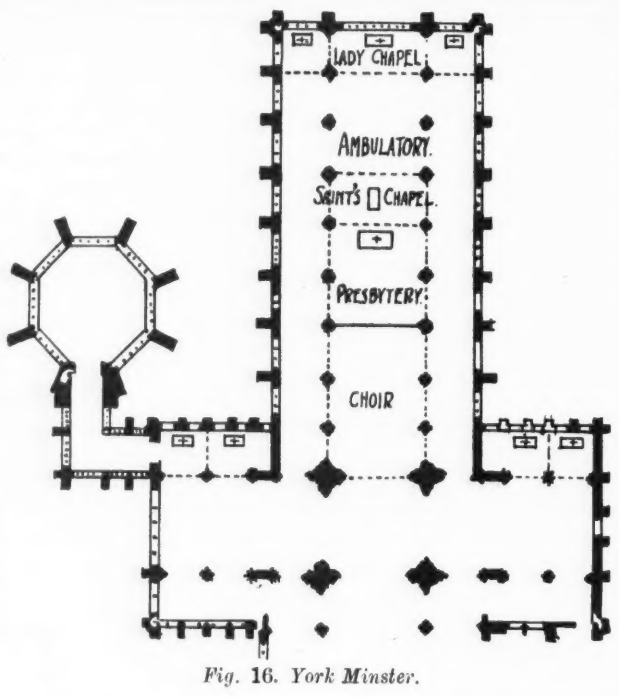


Fig. 16. *York Minster.*

out *c.* 1180 with four bays; Hexham, Whitby, Kirkham, Rievaulx all rebuilt their eastern limbs in the first half of the XIIIth century. Then came a magnificent series of choirs — Boxgrove, Thornton, St. Mary, York, Carlisle, with eight bays; Ely and York Minster, with nine bays; Lincoln, with ten bays; Old St. Paul's, with twelve bays.

As to their geographical distribution, to the North of England belong Jervaulx, Hexham, Whitby, Coverham, Kirkham, Rievaulx, St. Mary, York, Selby, Guisborough, Ripon, Howden, Carlisle, York Minster, Sallay. To the eastern counties belongs Ely only. To the south belong Old Sarum, St. Cross, New Shoreham, Portsmouth, West Langdon, Boxgrove, Netley, Old St. Paul's, Windsor. To the west belong St. David's, Tintern, and Bath. To the Midlands belong Lincoln and Thornton. It is plain that the aisleless parallelogram was as great a favourite in the North of England as the plans with external eastern chapels or external ambulatory and external eastern chapels were in the west. Another striking fact is the number of Cistercian churches which adopted this in place of the normal Cistercian plan. No less than five eastern limbs in great Cistercian churches were aisled parallelograms, viz., Jervaulx, Rievaulx, Netley, Tintern, Sallay.

In these churches all the usual ritualistic divisions were maintained, but they were not shown structurally, only by screens. Thus in York Minster the first bay from the east contained the Lady Chapel, to which the second perhaps served as vestibule or nave; the third was the ambulatory; the fourth was the Saint's Chapel (of St. William of York); the fifth and sixth were the presbytery; the seventh, eighth, and ninth were the choir, where were the stalls. The Lady Chapel, ambulatory, and Saint's Chapel were obtained simply by moving the high altar four bays to the west. Nothing could be more practical and straightforward than this final plan.

The position of the Saint's Chapel can be traced back to Hereford. There in the XIth century the easternmost bay of the presbytery formed an ambulatory; but when a new ambulatory was built late in the XIIth century outside the east wall, the old ambulatory was no longer needed. It seems probable that it was utilised as a Saint's Chapel, the chapel of the church's patron, St. Ethelbert. For it is on record that "this easternmost bay was decorated with a figure of St. Ethelbert when Bishop Mayew was interred on the south side of the bay in 1516." (Gordon M. Hills, *ibid.*, 497.)

To the above six groups belong (1) the whole of the mediæval cathedrals except the small Cathedral of Rochester, and (2) practically all the greater Benedictine and Cluniac abbey churches. However much they differ in the disposition of the parts of the eastern limb, they all agree in one point, that they are cruciform. The remaining churches are on a smaller scale, and are composed largely of Canons' churches and of those of the Cistercian monks.*

NOTES.

A Traffic Department of the Board of Trade. It is satisfactory to have to note that the Board of Trade has created a department to deal with the traffic of London, and of other districts, so far as it is under the control of the Board of Trade. As, however, so far as London is concerned the regulation of the traffic of omnibuses and cabs is in the hands of the Home Secretary and of the Commissioner of Police, it is not clear what the actual functions of the new department will be. There can be no doubt that it would be an advantage if the law were so altered as to hand over the duties of the Home Office in regard to London traffic to the Board of Trade. It is characteristic of our English ways that the Commissioner of Police, who *primâ facie* is the head of the police who have to prevent breaches of the law, should be the licensing authority for vehicles in the metropolis. The fact is, the whole matter is in about as unsystematic a condition as could well be imagined. The proposal that the new branch shall be placed under the control of Sir Herbert Jekyll is one deserving unqualified commendation. In addition to the experience gained as Assistant Secretary in the Railway Department of the Board of Trade, Sir Herbert possesses the additional qualification of engineering knowledge, having served for more than twenty-five years as an officer of Royal Engineers. Although the Board of Trade will doubtless be able to deal advantageously with many matters affecting the traffic problem, the new department cannot possibly perform all the duties awaiting attention, and we take this opportunity of urging once more upon the Government the necessity of establishing a central traffic board on the lines recommended by the Royal Commission. While in itself deserving the thanks of the community, we fear that the action of the Board of Trade must be taken as an omen of further delay on the part of the Government.

The Railway Companies. At the General Meetings held by three principal railway companies — the Great Eastern, the South-Eastern, and

* To be continued.

the London and Brighton—the statements of the Chairmen were entirely in accord on one subject, their attitude towards the trade union society, the Amalgamated Society of Railway Servants. All three companies were able to state that the reports of discontent amongst their servants were being engineered by this Society, and that, in fact, excellent relations existed between the companies and their respective staffs, but the Chairman of the Great Eastern Railway Company was able to give some interesting figures and to state that out of 16,327 employees eligible as members of the Society, only 1,402 men belonged to it, or 9 per cent. This small minority of men, through this Society, were claiming to represent the remaining 91 per cent. Whatever may be the increased prosperity of this country, it is evident from the reports of railway companies yet to hand that these undertakings are not receiving the benefit of it. These companies are under statutory obligations which are not imposed on other trading companies, they have to perform important public duties at fixed rates, and their charges cannot be made elastic so as to meet the varying exigencies of the moment. The railway companies have built up the prosperity of the country, have contributed to the growth of those cities which now, owing to municipal trading, are becoming their principal rivals in trade, and as ratepayers they are the largest contributors to the funds out of which the trade rivalry is maintained. They have, moreover, owing to their sound commercial management been the principal repositories for the savings of nearly all classes in the community. They are now confronted with the agitation of a Society which Parliament has declared can do no wrong, and they themselves are the subject of much prejudice in Parliament, since their Bills relating to questions of capital and maintenance no longer are considered on their merits, but outside and political influences are allowed to bear upon them. It will be a serious loss to the country and to the working classes in particular if our main lines of communication are made to suffer at the hands of agitators and visionaries, and the public have every incentive, both as customers and shareholders, to see that the finest limited companies in the world should be enabled to maintain their efficiency and independence.

The Brooklands Dust Trials. A GOOD deal of useful information is to be gathered from the recent "dust competition" of the Royal Automobile Club at Brooklands. Far less dust was raised by cars fairly high above the ground than by the lows cars which are generally favoured. Cars having no downward projecting parts were comparatively harmless, while those with low-hung engines, petrol tanks, and shields were conspicuously efficient as dust raisers. The direct effect of projections was to form a wedge-shaped column of air which, being forced out at the back, rebounded from the road, carrying great volumes of dust with it. Two other causes of unnecessary dust raising were certain types of tyres and vertical exhaust pipes. Moreover, the amount of dust raised appeared to be in direct proportion to the speed of the cars up to forty miles an hour. In the results here quoted we have sufficient evidence to prove that if regulations were made compelling builders to avoid all projections on the underside of cars, and to make the underside not less than, say, 3 ft. above the roadway, there would be a very marked diminution of the dust nuisance. It may be urged by the users of cars that the use of high bodies would increase the danger of turning curves at high rates of speed. That brings us to the third point, that high speed is unnecessary, and at the same time very undesirable in the interests of the general public, especially in the vicinity of curves and corners. Legislation of the kind here suggested would not only reduce the quantity of dust raised, but also compel motorists to keep within reasonable limits of speed.

The Law of Light. THE House of Lords have affirmed the decision of the Court of Appeal in the case of Fear *v.* Morgan. At present the judgments are not reported at length, and we will confine ourselves to the statement that this case decides that under the Prescription Act, where two adjoining tenements are held by two lessees under separate leases granted by a common landlord, a right to light can be acquired by the lessee by twenty years uninterrupted enjoyment, not only against the adjoining lessee, but also as against the landlord and his successors. This decision follows the case of Frewen *v.* Phillips, decided in the year 1861, and the Court of Appeal held that this case and others following it was not overruled by the decision of the House of Lords in Colls *v.* Home and Colonial Stores, which case, to some extent, marked a new departure in the law of light. We shall revert to this subject when the judgments delivered in the House of Lords have been reported.

Aberdeen Granite. IN a paper read before the summer meeting of the Institution of Mechanical Engineers Mr. William Simpson described in detail the methods of granite quarrying practised in Aberdeenshire. The industry has developed very slowly, and even in the present day most of the engineering plant employed is of old-fashioned character, and does not place quarry-owners in so favourable a position as could be desired for competing with importers of foreign granite. As might naturally be expected, this aspect of the Aberdeen quarries received a considerable amount of attention during the discussion of Mr. Simpson's paper. While agreeing in the main with the criticism evoked we quite understand that in the existing condition of the industry quarry proprietors would find it difficult to make sweeping changes in their methods owing to the heavy capital expenditure that would be involved. Our readers will find in the paper some useful notes upon the granite areas of North-east Scotland and upon the qualities and uses of the various qualities of stone quarried in the Aberdeen district.

Portable Pneumatic Tools. AMONG the varied uses of pneumatic tools mentioned in the paper read by Mr. Herbert Bing at the Aberdeen meeting of the Institution of Mechanical Engineers the most important to our readers are those connected with the quarrying and stone-dressing industries. Heavy pneumatic rock drills are now applied to drilling holes for blasting charges, hand-plug pneumatic drills facilitate the reduction of large blocks, and pneumatic surfacing hammers, mounted on suitable framework, are employed with much saving in dressing granite, marble, and other stones and in preparing them for polishing. Machines of the kind are capable of performing as much work in a given time as six or seven men, and where employed the cost of production has been materially reduced and the output proportionately increased. Two comparatively novel types of appliance, described and illustrated in the same paper, are the pneumatic sand-sifter and the pneumatic sand-rammer. The former comprises a rectangular sieve mounted on rollers attached to the upper part of a frame and a reciprocating machine—very much like a pneumatic hammer—for shaking the sieve. The latter is virtually a long-stroke pneumatic hammer fitted with a special ramming head suitable for tamping sand or concrete in moulds and for ramming earth in foundation work. A small rammer of this kind is equivalent to from two to four men, and the largest size made will do as much work as from eight to twelve men using hand rammers.

The Bradford Tramway Accident. ALTHOUGH the precise cause of the serious accident at Church Bank, Bradford, is not yet known, there is no doubt that the displacement of the trolley from the overhead wire at the top of the hill had the effect of increasing the gravity of the mishap. Owing to the interruption of the electric circuit between the car and the supply cable the electric brakes were rendered inoperative, and, notwithstanding his efforts, the driver was quite unable to regain control of the car by means of the hand brakes at his disposal. This accident serves to emphasise another disadvantage of the overhead system, the employment of which in hilly districts certainly demands the employment of exceptionally powerful mechanical brakes for use in case the trolley should be accidentally displaced.

Radio-Telegraphic Convention. CONSIDERABLE misapprehension exists as to the scope of the international agreement entered into at the Radio-Telegraphic Convention at Berlin. It has been reported in Parliament and elsewhere that the one object of the Convention was to break up the Marconi Company, and to destroy the regulations with which it had surrounded its organisation. The answer by Mr. Haldane in Parliament last week to a question in connexion with the Convention conclusively disproves this allegation. He pointed out that Mr. Marconi, like other inventors, had sold his rights to a powerful company, and so there was no question of sentiment in the matter. The company had entered into an agreement with the Post Office,

by which they bound themselves to give up their rights in the not unlikely event of the Post Office entering into such a Convention. The company naturally does not like the Convention being ratified, but there is no question of hardship. The results arrived at are confined to communication between ship and shore, and do not apply to communication between ship and ship, or between two land stations. It was expedient, both on account of humanity and of international amenities, that there should be the freest possible communication between ship and shore. The Army, the Navy, and the Post Office are all thoroughly satisfied with the agreement, and the great bulk of scientific and professional opinion was in favour of ratifying the Convention.

Paul's Cross, London.

THE Dean and Chapter of St. Paul's have accepted Mr. R. Blomfield's designs for a memorial of Paul's Cross to be erected in pursuance of a bequest of the late Mr. H. C. Richards, K.C., M.P. The design consists of a decorative pedestal with sculptured figures, carrying a column, which supports a bronze statue, 9 ft. high, of St. Paul. The site of the original Cross, latterly marked by an elm-tree, in the churchyard, lay near "the shrowds," a shelter along the north-east side of the Cathedral. It was a trysting-place for folk-mote and similar assemblies of the people who were summoned thither by the bells of old St. Faith's Church, hung in the adjacent tower. Mention of it occurs as early as 1191, when William FitzOsbert, or Longbeard, declaimed there against the right divine of kings. In course of time the Cross became the accustomed place for abjurations, denunciations, promulgation of Bulls, and so on. At the end of the XIIIth century it was first used for the preaching of the Sunday forenoon sermons—not always in a non-political or conciliatory strain. After its injury by lightning in 1382 Thomas Kempe, Bishop of London (1448-82), rebuilt the Cross, which thenceforwards until its demolition in 1643, by order of the Long Parliament, served for the delivery of discourses upon matters of more or less national concern, and for playing with the superstition, the humours, and the affections of the citizens. Jane Shore's penance, public recantation by heretics, the burning of Tyndale's New Testament, Queen Elizabeth's thanksgiving for the destruction of the Armada—these episodes sufficiently indicate its manifold uses. The pulpit was constructed of timber, upon stone steps, with a leaden conical roof, or canopy, surmounted by a small Latin cross; the foundation-stones, laid octagon-wise, were found some years ago by Penrose when the graveyard was laid out as a public garden. There are good views of the Cross in Henry Farley's "St. Paul's Church: Her Bill for the Parliament," 1621, and by J. Stow for R. Wilkinson, 1811, after the panel painting of Dr. John King preaching before James I. on March 26, 1620, *penes* the Society of Antiquaries.

The Architectural Association Schools.

WE have received the curriculum of the Architectural Association, from which we learn that some changes have been made in the teaching staff. Mr. H. P. G. Maule, the popular and successful headmaster of the schools, retains that position, assisted by Messrs. H. A. Douglass, L. M. Gotch, H. L. Samson, Alan Potter, T. O. Foster, and Alan L. Snow. In the evening school, Mr. C. E. Varndell has been appointed to succeed Mr. T. F. Green, Mr. A. C. Dickie acting as assistant master. Other alterations in the *personnel* of the evening school are: Mr. F. T. Baggallay takes "Architectural Features" in place of Mr. H. H. Stannus; Mr. H. L. Samson, "Elementary Physics"; Mr. R. J. Tasker, "Elements of Quantity Surveying"; and Mr. Theodore Fyfe succeeds Mr. Stannus as lecturer on "Greek and Roman Architecture and Classic Ornament." Mr. Basil Champneys and Mr. Leonard Stokes have been appointed by the Board of Architectural Education to act as Special Visitors, who will keep themselves in touch with the work of the school and confer with the masters from time to time as to the progress made and the methods adopted. This can but result in the continued success and prosperity of the school, which we hope will have another successful year.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT COLCHESTER.*

ON Saturday, July 27, the party, numbering as before about eighty, went by train to Maldon Station, and thence in carriages up the steep ascent to All Saints' Church. The architectural features of this building were pointed out by Mr. P. M. Beaumont, who called attention to the unique three-sided tower, the Purbeck pillars of the south arcade, the rich work in the Darcy chapel or south aisle, and the contemporary vaulted charnel-house or bone-hole under the aisle itself. Mr. Hope suggested that the singular plan of the tower was due to the desire to leave a procession way between it and the street to the west, which has now been widened up to the tower. The party next proceeded on foot to the Spital Chapel, about half a mile out of the town, an interesting aisleless cruciform structure of late XIIth century date, now much mutilated, and used as a barn. The south gable was rebuilt in the XIIIth century, and contains a triplet of lancets. Returning to Maldon, an inspection was made of the Tudor town hall, where are displayed in frames a most interesting collection of the town charters, and of the theological library in the desecrated church of St. Peter, founded by Dr. Plume, Archdeacon of Rochester (*ob.* 1704).

After luncheon the journey was continued in carriages to the remains of Bileigh Abbey, which Mr. R. C. Fowler described as a house of Premonstratensian or White Canons, founded as early as 1172 by Robert Mantell at Parndon, but removed to Bileigh in 1180. Mr. Hope pointed out the site of the church, which was long ago dug out for gravel, and showed that the existing remains consisted of the chapter-house, a vaulted passage next to it, and the warming-house beyond, with the dorter above, and part of the southern range of buildings with the east end of the frater. The chapter-house, which is of a date *circa* 1200, is quite perfect, and has the peculiarity (which it shares with Kirkstall Abbey) of a double entrance, flanked by the usual windows. The vault is carried down the middle line by a row of Purbeck monolithic columns. The warming-house has a similar row of pillars to carry the vault, and a fine later fireplace. Heybridge Church, which was next visited, consisted originally, as was shown by Mr. Hope, of a chancel, nave, and large tower, all of the Norman period. A clearstory was afterwards added to the nave, larger windows inserted to give more light to the nave altars, and the chancel lengthened. But owing apparently to a fall of the tower late in the XVth century, to which date the roofs belong, the clearstory, tower arch, and chancel arch had been removed, and the church reduced to its present condition. On the return journey to Witham Station Langford Church was inspected. This is remarkable in having had an apse at *both* ends of its nave, and though the eastern one has practically been destroyed by a later rebuilding, the western apse still remains.

Monday, the 29th, was devoted to an excursion to Thaxted and district. Leaving Colchester by an early train, the party first went to Dunmow, and drove to Great Dunmow Church, which was described by Mr. W. H. St. John Hope. It consists of an ample early XIVth century chancel, a nave of the XVth century with earlier aisles and a south porch, a late south chapel, and a western tower. The mending of the windows in the "new chapel" is referred to in the churchwardens' accounts for 1526, which also tell of much work going on the same year on the "stepyll" and of the re-casting of the bells. A curious early XVIth century wooden gallery built out into the aisle from the parvise of the porch was probably a pew or "closet."

Tiltey Abbey, which was the next objective, was described by Mr. Hope as a house of Cistercian monks, founded by Robert de Ferrers and Maurice FitzGeoffry in 1153, and colonised from Wardon. It probably began with the usual temporary buildings, for it was the second abbot, Dan Symon, of whom the Coggeshall chronicler wrote on his death in 1214 that (*gracia Dei sibi cooperante*) *quasi de pauperrima grangia pulcherrimam et opulentam instituit abbatiam, in qua zelus religionis cum prudentia seculari contendebat.* The church and almost all of the buildings had long been destroyed, but the gatehouse chapel had been preserved intact, and was still used as a church for the neighbourhood. It consisted at first of a simple oblong, with lancet windows of the plainest possible character, but about the middle of the XIVth century a small but wider chancel had been added on with large traceried windows of extraordinary beauty, and triple sedilia and piscina of equal excellence. In the old south wall are the original double-drained piscina and aumbry of the XIIIth century, and the building is rich in brasses and monumental slabs.

At Horham Hall, which was next visited, the party was received by Mr. and Mrs. A. P. Humphrey, and the chief features of interest described by Mr. T. D. Atkinson. The house, which is built of brick, was largely the work, about 1510, of Sir John Cutte, whose great hall, great chamber, and other rooms remain in good order, but the buttery and pantry block contains, in the upper story, the open roof and other traces of (probably) the chapel of an older house *circa* 1470. The kitchen, which stands obliquely to the rest of the building, dates from the middle of the XVIIth century. At the opposite end of the house is a lofty Elizabethan tower for viewing deer drives in the surrounding park.

After luncheon at Thaxted, the party reassembled in the fine and spacious parish church,* the chief features of which were pointed out by Mr. Hope. It consists of a chancel with north and south aisles of four bays, with eastern half-bays for the altars, a crossing and north and south transepts, a nave and aisles of six bays with north and south porches, and a western tower and spire. Under the east end of the chancel is a charnel or bone-hole, now inaccessible. The oldest portions are the nave arcades and the western arch of a former central tower, and probably parts of the transepts, and belong to a reconstruction which was apparently stopped by the Black Death in 1349. The curious but poor chancel arcades, with pierced spandrils, belong to a rebuilding consequent on the fall or removal of the central tower, in the XVth century, but the far finer windows of the aisles belong to an earlier work. The nave aisles were widened, and the fine porches added about 1450, to which date the eastern windows of the church belong. Lastly came the clearstories to chancel and nave, and the western tower and spire. The aisle windows

* Continued from last week.

* A careful plan and measured drawings of this church, by Mr. C. Wontner Smith, were published in the *Builder* for April 29, 1899.

contain a great quantity of fragments of the original coloured glass, with remains of figures of saints and pictorial subjects, which have lately been judiciously rearranged as far as possible. The font is concealed within a curious wooden canopied case of early Tudor work, and the pulpit and sounding-board are good examples, *temp.* Charles II. The mediæval roofs remain throughout, and with the plastered and whitewashed walls add largely to the dignified effect of one of the finest churches in Essex.

The journey was next continued to Great Bardfield, where another interesting church was visited. It was described by Mr. Hope as consisting of an early Norman chancel, the date of which had been obscured by the insertion of larger XIVth and XVth century windows, of a nave and aisles with south porch, and a western tower, surmounted by a slim wooden spire covered with sheets of lead. The tower is of late XIIth century date, but the nave and aisles, with the clearstory and the original roofs, belong to the last quarter of the XIVth century, and were probably rebuilt by Philippa, daughter of Lionel, Duke of Clarence, and, *suo jure*, Countess of Ulster, who married Edward Mortimer, Earl of March, about 1368, and died in 1381, shortly after her husband. The aisles have fine and large square-headed windows with delicately-wrought tracery. The noteworthy feature of the church is the chancel arch. This is of the same date as the nave, but subdivided into three openings by stone mullions with beautiful tracery above, carrying, in the middle division, carved brackets for the rood and SS. Mary and John. The original figures had long been destroyed by Puritan fanatics, but have lately been replaced by new. The aisle windows contain some fine fragments of the original coloured glazing, including shields of the arms of Mortimer, King Edward III., and of the rebuilder of the nave.

A visit was to have been paid to Stebbing Church, a beautiful building, *temp.* Edward II., with a (restored) chancel arch similar to that at Great Bardfield, of which it was clearly the prototype; but owing to an earlier mishap to one of the conveyances the journey had to be continued to Dunmow, whence the party returned by train to Colchester.

In the evening the annual business meeting was held, when the report of the Council was read, new members proposed, and votes of thanks passed to all who had contributed towards a most successful meeting. Some discussion also took place as to the centre for next year's gathering, Oxford, Durham, Northampton, and Lincoln being among the towns suggested. The final decision was, as usual, left to the Council.

On Tuesday, the 30th, carriages being in readiness at the Town Hall, a start was made punctually at 10 a.m. for Brightlingsea Church. This interesting structure was described by the vicar, the Rev. A. Pertwee, who pointed out that the XIIIth century chancel and the three eastern bays of the nave, of XIVth century date, were the oldest portions. The rest of the nave and the fine western tower belonged to the closing years of the XVth century, but the contemporary clearstory and nave roof had collapsed in 1814, and the former had not been rebuilt. The north or Lady chapel was lengthened by bequest of one John Beriffe in 1521, and the vestry on the south side was built through gifts of John Cowper, mariner, and others about 1538. The south porch has some delicately-worked details of the middle of the XVth century. The church contains some interesting brasses and other monuments and a curious font and cover under the tower.

The journey was then continued to St. Osyth's Abbey, where the party was received by the owner, Sir John H. Johnson, and most kindly allowed access to every part of the buildings. Mr. Hope once more acted as demonstrator, and explained that the monastery was said to occupy the site of a religious house built in honour of St. Peter and St. Paul, by Osyth, the saintly daughter of King Frithwald, and wife of Sighere, King of Essex, from whom she ran away on her wedding day and took the veil. Here she lived until martyred by the Danes in 635. The later monastery was a house of Black Canons, founded before 1118 by Robert, Bishop of London, but little was known of its history. According to the Coggeshall chronicler, Dan Ralph, the second abbot, who died in 1215, "*locum illum magnifice in sumptuosis edificiis in redditibus et sacre religionis cultu decoravit.*" The privilege of wearing the mitre and ring and other pontifical ornaments was conceded to the abbot in 1397, but annulled in 1403, and re-granted in 1412. The abbot and twenty-four canons appended their names to the Acknowledgment of Supremacy in 1534, and the annual value was then reckoned at 758*l.* gross, or 677*l* in the clear.

The inventory taken at the Suppression bears witness to the wealth of the house, and is also of use in giving the names of all the buildings. The church lay south of the cloister, but had been clean swept away, and of the claustral buildings there only remained some portions of the eastern and western ranges, both closely entangled with excellent later work built shortly after the Suppression. They included some fragments of the original XIIth century buildings. The present house contained some interesting traces of the abbot's lodging, which adjoined the north end of the dorter range, and had been largely reconstructed by Abbot John Vyntener, whose rebuses with the date 1527 could be seen on the large oriel of his time. Much excellent wood panelling, also Abbot Vyntener's work, is preserved in the house, but not *in situ*. The most prominent of the later works is a tall brick tower, which perhaps did double duty as a sea-mark and for watching deer drives in the park. The fine and noble XVth century gatehouse, with its panelled front and elaborate niches and vaulting, is still in excellent order, and forms a suitable home for successive relays of destitute London boys who are entertained here by Sir John Johnson.

Although not an item of the official programme, time permitted of a visit after luncheon to the parish church hard by, which Mr. Hope explained as affording an interesting example of a nave which was undergoing reconstruction at the time of the Suppression of the Abbey, the older nave having been replaced by a much wider one with piers and arches of moulded brick. These were no doubt intended to carry a clearstory, but this and the new chancel arch had not been carried out.

The day's work concluded with a visit to Great Clacton Church, which had a nave of Norman date covered originally, like Copford Church, with a barrel-vault. The apsidal chancel has given way to a modern one.

At the evening meetings papers were read on "Traces of Saxons and Danes in the Earthworks of Essex," by Mr. I. Chalkley Gould, and by Mr. Henry Laver on "The Destruction of Colchester by Boadicea."

Tuesday, the 30th, was actually the last day of the meeting, but it was arranged that Wednesday, the 31st, should be regarded as an extra day for a visit to the site of the Roman coast fortress of Othonæ, near Bradwell-juxta-Mare, and to the ruined church or chapel of St. Peter-on-the-Wall.

The party, to the number of about fifty, left Colchester by special train for Southminster, and drove thence to their destination. After luncheon, Mr. Henry Laver indicated the site and remains of the Roman station, which was encompassed by a wall and towers of masonry, and showed its relation to the other fortresses of the Saxon shore. Half of the area of the station is now below high-water mark, but some portions of the walls may yet be seen. Built across the line of the western rampart are the ruins of the Chapel of St. Peter, now used as a barn. This consisted originally of a deep apse, an oblong nave with a triple arch between it and the apse, and a western porch which was afterwards carried up as a tower. The building was claimed by Mr. Hope, on the evidence of its plan, the triple chancel arch, and its general construction, as the church which is recorded by Bede to have been erected by Cedd, about 653, when he was consecrated Bishop of the East Saxons, at Ythancester, on the banks of the Pant, or Blackwater. The nave, with its original buttresses and window openings, is still in good order, and has been built in the Roman manner out of the ruins of the Roman fortress.

On the return journey to Southminster a halt was made at Tillingham, the manor of which has been in the possession of the Cathedral Church of St. Paul in London ever since the gift of it by its founder, Ethelbert, King of Kent, in 604! Tillingham Church has unfortunately been thoroughly "restored," and is now utterly devoid of interest. Some of the party also inspected Southminster Church, which has a wide early nave, a good vaulted porch of the XVIth century, and a western tower. The eastern part of the building is modern. The return special train subsequently conveyed the party home again, and so the Colchester meeting came to an end. The arrangements throughout were excellently and punctually carried out by the Hon. Secretary, Mr. W. Hale Hilton, and his lieutenant, Mr. W. Bruce-Bannerman, and, both as regards weather and the numbers attending, the meeting was in every way a most successful one.

EXHIBITION OF SCHOOL BUILDING AND FURNISHING APPLIANCES.

In connexion with the second International Congress on School Hygiene an exhibition, organised by the Royal Sanitary Institute, is being held from August 5 to 14 in the London University portion of the Imperial Institute at South Kensington. Nominally the exhibition is intended for the display of school building and furnishing appliances, but in reality it has a wider range, as, in addition to appliances of various kinds, it includes a large number of books, pamphlets, plans, diagrams, photographs, statistics, courses of study in schools of different kinds, specimens of students' work, etc., many of which are of interest to architects as well as to teachers. It will be convenient to divide the exhibits into three groups, the first consisting of school building and furnishing appliances, the second containing the British and Colonial loan collection, and the third the foreign loan collection.

In the vestibule the England Works (Leeds) exhibit their steel self-contained cloakroom fitting, supplied with heating coils for drying clothes, etc., and coated with aluminium paint. The framework is of steel tubing, and wire netting is fixed between the framework. A bronze medal has been awarded to the firm for this fitting. At an adjacent stand different kinds of typewriting machines and other office requisities are shown by the Yōst Typewriter Company. Messrs. Newton & Co. (stall No. 1) exhibit optical lanterns fitted with oil lamps, acetylene generators, limelight, and with electric arc lamps, and also a number of lantern slides. At the next stall Messrs. Fletcher, Russell, & Co. (Warrington) show a number of laboratory and workshop appliances for use with gas, including blow-pipes, bunsen burners, small furnaces, etc. The Wenham Lighting Corporation (stall No. 3) exhibit their well-known regenerative gas-lamp in its original form, and also as now adapted for use with small inverted incandescent mantles. From one to six mantles can be used in a single lamp, and a brilliant and steady light is obtained. The same firm's mercurial gas-governor is also shown.

Passing by the British loan collection, we come to stall No. 24, where Messrs. A. E. Podmore & Co. exhibit their dust-proof bunsen burner intensifying gas-lamps. These are fitted with one or more incandescent mantles, which may be of the ordinary or of the inverted type. A bronze medal has been awarded for this lamp. The Gas Light and Coke Company (stall No. 25) show gas-fires and cookers of the usual types, including dog-grates, and also the "Carbo" smokeless fuel. Messrs. Bratt, Colbran, & Co. (stall No. 26) exhibit their well-known "heaped fire" with different kinds of metal and faience surrounds and wood chimney-pieces, and at the next stand the Davis Gas Stove Company show four large and well-finished gas cooking appliances. The earth-closet exhibited by Mr. J. T. Ditchfield (Cape Town) is on the usual lines, and is not equal to that shown at the next stall (No. 29) by the British Sanitary Company (Glasgow). A silver medal has been awarded for this company's self-acting closet; the release of the seat operates a simple mechanism, which spreads a quantity of earth from the container automatically over the contents of the pail below. The Plastoment Asbestos

Flooring Company show their jointless flooring as applied to concrete and to boarded floors. The Æosan Company (Birmingham) exhibit a bath attachment by which compressed carbonic acid gas or oxygen can be discharged into the water of an ordinary bath, and at No. 34 the British Challenge Glazing Company show their system of patent roof-glazing with lead-encased steel bars, and an associated firm (the Challenge Flooring) show their jointless flooring in different colours. Messrs. Candy & Co., at No. 34, show three varieties of their "Devon" fire with surrounds of glazed bricks, briquettes, and faience respectively.

The Leeds Fireclay Company, at No. 36, have a large exhibit of sanitary fittings, and have gained one bronze medal for their "Taper" stall urinal of glazed fireclay, the back, sole, channel, and pier of each stall being in one piece, and another medal for their "Infanta" closet set for girls, one of the features of which is the "Fixton" hardwood pad seat. Among the other exhibits worthy of notice are the "Kutla" salt-glazed urinal slabs with overlap joints, but without divisions; the school urinals with semi-circular backs forming stalls 18 in. wide from centre to centre; and the "Isolta" latrines with glazed fireclay basins, "Fixton" pad seats, and automatic flushing tanks. The earth-closet shown by this firm has a pan casing of salt-glazed ware. The lavatories are of different kinds, some of which are specially designed for use in schools, such as the "Bradford," which is of the corbel type fitted with "Lumbrook" spray-taps; the "Copley," "L.C.C.," "S.I.A.," and "Open Channel" lavatories are also provided with lugs for building into the walls. Among the other exhibits by this firm are drinking fountains, faience fireplaces, glazed bricks, partition bricks, and wall tiles. At stall No. 37 the Limmer Asphalt Paving Company show specimens of their asphalt and various ways in which it can be applied in the construction of buildings. Messrs. Humphreys have erected a stand of wood and corrugated iron, and exhibit in it a number of drawings of temporary school buildings. A bronze medal has been awarded to the Combination Collapsible Ventilator Company (Liverpool) for their glazed hopper attachment for sash-windows. This consists of two triangular cheeks of steel and glass attached to the lower part of the sash-frame and pivoted at the top and bottom, and of a glazed screen, which is fitted between the two cheeks in such a way that the top of the screen can be drawn forward into the room to divert the current of air upwards when the lower sash is opened; when the sash is closed the screen and cheeks can be pushed back to lie in a vertical plane. Another exhibit by the same firm consists of a hopper casement above a sash-window, the hopper being opened by the raising of the sash. Messrs. Sulzer Brothers, at stall No. 41, exhibit the plans of the heating apparatus in three schools in Switzerland, and also two radiators, the special feature of which is the evaporating pan at the top covered with a light grating. A silver medal has been gained by the Chaddock Mechanical Window Company (Liverpool) for their automatic window ventilators exhibited at stall No. 46. The windows consist of a wide lower casement pivoted in the centre at the top and bottom, and of two narrow upper casements side by side above a fixed transome, and with a fixed mullion between them; the upper casements are pivoted at the sides. By means of gearing the upper casements are first opened exactly like ordinary swivel casements, but by continuing to turn the handle of the gearing the lower casement can be opened to any required angle. The arrangement allows the openings to be regulated to prevent draughts, and the casements can be cleaned on both sides from the inside of the room. The windows have been used in a number of schools and other buildings in and near Liverpool, and appear to be very successful as ventilating appliances. In some cases a fixed sash is provided below the wide opening casement.

Messrs. Pryke & Palmer have received a bronze medal for an enamelled steel bath "on a wheeled cradle," but what the wheeled cradle is we do not know, as at the time of our visit the bath was on a wooden stand. They have also received a bronze medal for Palmer's patent "Ogee" gutter, the special feature of which is that on the back of each length there are three projections, through which the fixing screws are passed, the backs of the projections and of the external sockets being on the same line. This arrangement may have certain advantages in fixing the gutters, but scarcely seems worthy of a bronze medal in an exhibition of school-building appliances. At the same stand are a number of locks and door furniture, fanlight openers, the "Ideal" sash-line fasteners, hot-water radiators, and the metal ladder-tape for use in thin partitions. Mr. William Cassels (Stirling), at stall No. 48, shows different varieties of the "Clarifont" constant-stream lavatories for schools. The fittings are simple and easily controlled, and a silver medal has been awarded in respect of them. The same exhibitor shows the "One-each" towel distributor, and for this he has been awarded a bronze medal. The towels are arranged in a box having an opening at the bottom, through which one towel at a time can be taken. The "Wallinset" urinal for boys is a shallow stall urinal in glazed fireclay for building into a brick wall, and taking the place of one thickness of brick. At the next stall (No. 49) the Berkefeld Filter Company exhibit different adaptations of the "Berkefeld" pressure and non-pressure filters. At stall No. 50 Messrs. J. Duckett & Sons (Burnley) have a large display of sanitary fittings, for which they have been awarded one silver medal and three bronze medals. The silver medal is for the "Overflow" lavatory, which is of the constant stream type, the water overflowing when the basin is in use into a large open channel at the back. Other lavatory basins, drinking fountains, etc., are also shown. A bronze medal has been awarded for a wash-down water-closet fitted with Debney's patent radial-jointed trap-outlet. The invention allows the trap-outlet to be turned in any direction, but, although this has its advantages, it is not so useful as at first sight it appears, for if a trap-outlet is turned too far round the force of the flush is dissipated and does not always clear the contents from the basin. School wash-down closets and siphonic latrines are shown, and also a number of urinals, for two of which bronze medals have been awarded. One of these urinals, the "Solent," has a semi-circular back, the curved sides overhanging the channel below. The other is a slab urinal, each stall being in one piece of cane-glazed ware, and the inner angles being rounded. Gullies of different kinds and air-bricks are among the other manufactures of the firm. The Ajax Sanitary Company, at stall No. 51, exhibit different varieties of the "Ajax" lavatory basin, which has a shutter or sliding valve, or a movable weir in place of the usual overflow and waste arrangements. The arrangement is extremely simple, but it remains to be seen whether all the varieties remain watertight.

The British Doloment Company, at stall No. 52, show their patent jointless flooring, which is laid in a double layer $\frac{7}{8}$ in. thick. It is said that the top layer is impervious to liquids, including acids and oils. No doubt the double layer has its advantages, and the flooring has been selected by the judges for further consideration or practical trial. Messrs. Spencer, Heath, & George, at stalls 53 to 56, have an excellent display of gymnastic apparatus, etc., for which they have received a silver medal. At No. 57 Messrs. John Knight & Sons have a good assortment of drainage fittings, and have been awarded a silver medal for their combined stoneware and cast-iron fittings. These include stoneware traps with cast-iron airtight covers. Special attention may also be drawn to the different varieties of cast-iron access-caps for drain-pipes, etc., and to the access-gullies with side inlets for branch drains.

A staircase from this point leads down to the grounds, where the Ducker Company have erected a school-house with walls of yellow deal and felt. The material is put together in sections 2 ft. 9 in. wide and about 10 ft. high, the outside being clap-boarded horizontally and the inside covered with vertical match-boarding.

At stall No. 59 Messrs. John Jones (Chelsea) have a good display of sanitary fittings, and they have been awarded three bronze medals for (1) the "Denman" pedal spray lavatory with flushing rim-basin, (2) a school stall-urinal of buff glazed fireclay with a flushing cistern of similar material, and (3) the "gravitation" system of water supply to separate flushing cisterns in connexion with a range of closets. The system is fitted to a range of "Guild" pedestal wash-down closets, but was not in operation at the time of our visit. It consists of an automatic cistern, the outlet from which is carried under (and connected to) the three small cisterns fixed over the three basins. We assume that the water discharged from the large cistern passes into the small cisterns and is automatically discharged from these into the basins below, so that a powerful and equal flush is obtained in every basin. The same firm's "Eureka" anti-flood valves fitted to stoneware gullies have been selected by the judges for further consideration or practical trial, as also has their air-testing apparatus. Among the other fittings are different ranges of school lavatories, a school shower-bath, cast-iron inspection chambers for drains, airtight manhole covers, drain-clearing rods, plumbers' brasswork, etc. Different kinds of apparatus for the production of ozone for ventilating and manufacturing purposes are shown by the Ozonair at stall No. 60. Ozone is obtained by the silent discharge of electricity through air. The generators have been used in different types of building, and appear to have been successful in purifying the air.

Mr. P. Johannes Mueller (Berlin and Vienna), in addition to large drawings of school furniture, shows, at No. 61, some school-desks in which the desk-slopes and the seat-backs are adjustable, and which are also fitted with rising platforms so that the seats can be easily adapted for boys of different heights. Messrs. Hasserodt & Co. at the next stand exhibit the "Stumpf" reform sash-window which was described in our columns in connexion with the Building Exhibition three or four months ago. Messrs. Cristoph & Unmach (Neisky and Bunzendorf) show models of wooden school buildings erected on the pavilion system; in one case ten pavilions are grouped around a quadrangle, each pavilion accommodating two classes.

The Foreign Loan Collection is shown at stalls 66 to 89, and after passing these and some small exhibits of more interest to teachers than to architects we come to stall No. 93, where Mr. Michl. Alajos (Budapest) exhibits two changeable school-benches, for which a bronze medal has been awarded. At the next two stalls Mr. Joseph Winderlich (Bilin, Bohemia) and the Vereinigte Schulmöbelfabriken (Stuttgart) show other kinds of school furniture. Messrs. Thomas J. Syer & Co. at stall No. 96 exhibit different kinds of furniture, fittings, and apparatus for technical and secondary schools, and have received a bronze medal for their pupil-mechanic's bench with parallel vice. A bronze medal has also been awarded to Messrs. C. C. Meinhold & Sons (Dresden) for anatomy and physiology wall diagrams, and another to the School Furniture Manufactory (Germany) for a desk with movable table for needlework instruction, the desks being specially adapted for girls' classes. Other kinds of school furniture are shown by the same firm and by the Sandvikekys Aktiebolag (Helsingfors), by Messrs. H. & S. Addison (Reading), by Mr. Stanislaus Winkler (Austria), by the Bennet Furnishing Company, the Société Industrielle de Creil (Paris), and the Educational Supply Association, but at the time of our visit some of these exhibits were covered with dust-sheets, so that we had no opportunity of examining them. A bronze medal has been awarded to the Magazine Holder Company (Leeds) for the scholars' "Simplex" stands for holding books, drawing copies, etc., at any required distance and angle, and Messrs. Merritt & Co. have received a bronze medal for their steel and expanded metal lockers, which allow a thorough ventilation of the contents.

The British and Colonial Loan Collection forms what we have called the second part of the exhibition, and contains a number of drawings and photographs which will be interesting to architects and teachers. It is, however, a matter for regret that the collection of drawings of school buildings is very far from being representative of the work of British and Colonial architects. If the architects who are members of the Council

of the Royal Sanitary Institute had formed themselves into a sub-committee and had made an effort to obtain drawings of typical examples of elementary, secondary, and technical schools, an exhibition of great educational value might have been obtained. As it is, we look in vain for specimens of the work of some of our best school architects and for drawings of our largest schools and colleges. Taking the drawings in the order of the catalogue, we have first a perspective of Bedale's School, near Petersfield, designed by Mr. E. P. Warren, F.R.I.B.A.; the only plan of the school is a small plan of one floor in a corner of the perspective drawing. The catalogue mentions a high school for girls at Shrewsbury, built in 1898 from the designs of Mr. A. E. Lloyd Oswell, A.R.I.B.A., but we were unable to find the drawings. One small sheet showing the plans of three typical secondary day schools for girls at Clapham, Wimbledon, and Sheffield is shown by Mr. J. Osborne Smith, F.R.I.B.A. One of the best collections of drawings is that supplied by Mr. T. J. Bailey, Architect to the late London School Board. These are working drawings of an elementary school at Wandsworth, a secondary school, a school for crippled children, a technical institute, and centres for cookery, laundry, housewifery, and woodworking. In addition to these, there are sheets illustrating the standard details of drains, manholes, soil-pipes, etc. Mr. Percy Morris, A.R.I.B.A., Architect to the Education Committee of the Devon County Council, exhibits the plans of three types of elementary school, one at Heavitree, near Exeter, being of the corridor type with seven classrooms on each of the two floors, another at Ilfracombe with an assembly-hall and six classrooms on one floor, and the third a small mixed school at Bratton Fleming. Nottingham is represented by the drawings of a secondary school designed by Mr. A. N. Bromley and of three elementary schools and a technical centre designed by Mr. Frank B. Lewis, City Architect, Nottingham. The buildings designed by the City Architect are without architectural merit, and in some of the drawings the brickwork behind the fireplaces is only 4½ in. in thickness; probably the Education Committee is responsible for this cheese-paring economy, but surely the small additional cost involved in giving to the buildings some architectural interest would be money well spent from an educational point of view. From Scotland there are photographs lent by the Edinburgh, Leith, and Govan School Boards and others, and an interesting portfolio of drawings from Aberdeen. These are the working drawings of a higher grade school and of two elementary schools in Frederick-street and at Woodside. The Frederick-street school has an assembly-hall and five classrooms on the ground floor, and two stories of classrooms, etc., over. The Woodside school has a central hall, with corridors and classrooms at right angles to the hall and on opposite sides of it.

The only Colonial drawings which we saw were those lent by Mr. T. Tyrwhitt, A.R.I.B.A., of Pretoria. These show five typical schools designed for the Transvaal; they follow the English arrangements in the main, and are good examples of school planning. We cannot find any reference to them in the catalogue, but may say that at the time of our visit they were near the exhibits numbered 7 and 8.

The remaining exhibits in the British and Colonial section are not of particular interest to architects, and we will therefore pass on to the Foreign Loan Collection, numbered 66 to 89. An excellent collection of plans and photographs has been sent from Bohemia, including infants', elementary, intermediate, and high schools. Some of these, designed as they are in a manner appropriate to important public buildings and placed on well-planted sites of ample area, may afford food for thought to English architects and education committees. Denmark sends, among other things, some drawings of small school buildings. The exhibits from France occupy a large space, and although they include a number of plans and photographs of buildings, they are as a whole more interesting to the teacher and school manager than to the architect. From Germany there are views and plans of school buildings sent by the Town Council of Cologne, and an interesting series of plans of small and large schools sent by the Royal City Council of Dresden. The large schools are less compact than English schools of a similar class. The drawings of Dutch schools lent by Mr. J. A. Vryman, Government Architect for School Buildings (The Hague), do not appeal to us, but the Swedish exhibit is well worth a visit. It includes portfolios containing plans of school buildings (elementary, secondary, and co-educational), and a number of framed drawings and photographs. A large plaster model of the secondary school in Oestermahn, Stockholm, is also shown, and there are pamphlets (in English) containing the standard regulations for school buildings, a report on the ventilation and heating of the elementary schools in Stockholm, etc. The Grand Duchy of Finland, notwithstanding its political troubles, has issued an interesting book (in English) on "School Institutions and School Hygiene," which, in addition to information useful to the teacher, contains a number of plans, elevations, and views of schools of different kinds. Among these, we may mention the special schools for the deaf and dumb, the blind, the deformed, and for "exceptional" children. We cannot find any reference in the catalogue to this contribution from Finland. The Swiss exhibit, lent by the Building Administration of Zurich, includes plans and models of schools in and near that town.

It is a pity that the space allotted to the two loan collections is so small that the drawings cannot be properly displayed, but must be retained in the portfolios. The labour of inspecting them is thus very much increased, and it is an easy matter to overlook some portfolio or volume which may contain very useful and interesting information. The architect, however, who can afford ample time for a careful inspection will be able to learn something from the exhibition, and will also take a pleasure in discovering how his fellow-architects in foreign countries are solving the problems of school planning and building.

YORKSHIRE AND NORTH MIDLANDS MODEL COTTAGE EXHIBITION.

THE site of this exhibition is a high-lying piece of land known as the Wincobank Estate, just outside Sheffield, but near enough to be of practical use in showing the lines upon which the town might grow in this direction—instead of the squalid streets of the ordinary builders' cottages. The exhibition was opened on August 1, but owing to the bad weather hardly any of the cottages are finished, and the competitors have not as yet stated their cost, which makes it impossible to pass judgment as to which best fulfils the conditions of the competition. Enough, however, has been done to be able to criticise most of the cottages from an architectural point of view, and, as a maximum limit of cost has been fixed for each of the three classes, one can make some sort of guess as to whether they appear to be within this limit. This question of cost has been gone into very carefully by the promoters of the exhibition, and we think that their condition that "competitors shall undertake to sell their cottages if required to do so to the Sheffield City Council at the catalogue price, and to erect twelve more cottages at the same price," should be sufficient safeguard as to the genuineness of their prices. The exhibition has been arranged into three classes of cottages:—A, with two bedrooms, living-room, and scullery, etc., maximum cost of 175*l.*; B, with three bedrooms, living-room, and scullery, etc., maximum cost of 200*l.*; C, with three bedrooms, parlour, living-room, and scullery, etc., maximum cost of 225*l.*; all these prices to include architects' fees and builders' profits, but not cost of land or roads. The prizes consist of gold, silver, and bronze medals in each class.

Another feature of the exhibition was a preliminary competition which was held for the lay-out of the site, and a gold medal was awarded to Messrs. W. Alex. Harvey & A. McKewan, of Birmingham, for their scheme, which has been adopted with one or two modifications for the exhibition. A silver medal has been awarded to Messrs. P. H. Curry & C. C. Thompson, of Derby, and a bronze medal to Mr. Claude Batley, of London and Watford.

The site is undoubtedly an awkward one, and Messrs. Harvey & McKewan's scheme, which looks well enough on paper, can hardly be said to work out satisfactorily on the site. The plots round the central space are not well contrived, and the sites set apart for public buildings do not seem to have any special reasonableness, and the doctor's house and hostelry are thrown down at a venture, so that the committee have been well advised to depart from the plan and put ordinary blocks of cottages on these sites. Again, the slight curve given to the main road, Foxglove-avenue, which might be effective in a town with a continuous line of buildings carried round at one height, has a singularly unfortunate effect with the blocks of cottages standing separately and having different set-backs from the road. This curve only adds to that deplorable general effect which seems unavoidable when everyone has been trying his hand at something totally different from his neighbours—an effect which, in this case, is heightened by the approach to the exhibition through some streets of municipal cottages which have been built from the designs of Mr. Percy Houfton, of Chesterfield, in a quiet and restful style, and which are as good as anything in the exhibition, both as regards materials and design.

The forty-two cottages which have been entered are disposed into blocks of two, three, and four, but no single cottages, and it cannot be said that they exhibit any striking originality of plan or attempt to deal courageously with the problem of parlour and living-room, as Mr. Baillie Scott did at Letchworth. The most notable feature is that nearly all have placed their water-closets and coal in the main area of the house, opening on to a small lobby, with an arch to the outer air, following the lead of the prize cottage at the Letchworth Exhibition. There is a great deal to be said for this arrangement, as there is nothing to give that unmistakable backyard look, and there being no by-laws in Sheffield insisting on a paved yard, the garden can be brought right up to the building without being deformed by one-story excrescences which proclaim loudly what they are. In most cases the bath has been placed in the scullery, which is the obvious position for cheapness' sake, though always more or less unpleasant.

As regards external treatment, it is surprising that not one single competitor has made use of the local materials, and the more so as there is a fine old farmhouse facing one on entering the exhibition, and there are old cottages all round. These all have stone walls in very shallow courses—almost like flags—and roofs of the same material and about the same thickness. Of course one cannot say how the cost of these local materials would work out, but the builders complain that bricks are exceedingly dear there owing to the distance of carting, and the stone is certainly found on the spot. The fact remains that none of the cottages are really in harmony with the surroundings, however good they may be in design.

In Class A there are only four distinct exhibits, and three of these are combined in blocks with cottages in a different class, and none of them are really satisfactory. Exhibits 5 and 6, in one block with a mansard-roof, have slightly different plans, of which No. 6 is the better, in spite of the living-room having a staircase and three doors opening out of it. The brickwork is better than in many of the other cottages, but the building is roofed with the thinnest blue slates, and the woodwork is poor and picked out in two different colours. The bay windows to the living-room are of a sensible size, though the division by bars into three lights in the upper portion, and two in the lower, is impossible. There is only one chimney-stack, and there is a fireplace in each bedroom. If it had been carried out in better materials and not painted so garishly, this would have been a pleasing block, as it has a cottage character about it.

Nos. 23 and 25 are the end houses of a block, with No. 24 in class B in the middle, and they are much better planned than the central house, which has a badly-ventilated larder, and the squalid feature of stairs facing you directly as you enter, and lit by a borrowed light from the front bedroom. The outside has the commonplace division

into halves, with rough-cast above and brickwork below, the dividing line coming at such an unhappy level that all the ground floor windows kick up into the rough-cast, and there are two rather meaningless bands of brickwork which run into the middle of the jambs of the upper windows.

Nos. 9 and 12 are the end houses of a block of four, and very similar to Nos. 26 and 29. Both these blocks are dull and unoriginal on plan, and something worse in elevation. The central portion is carried up in a most mystifying way to give an extra bedroom to the central houses, and the back presents a dreary array of symmetrical vent and down pipes, and windows of every shape and size. A striking contrast to many of the blocks of cottages, whose backs have been as carefully designed as the fronts, and, in fact, should not be called back elevations, but rather garden fronts.

Class B has by far the most entries, and without the prices it is difficult to say which is the best and most economical. Nos. 15 and 16 are perhaps the best, in spite of one or two frailties, such as a few blue tiles let into the rough-cast on the front, heart-shaped fretsawings cut out of the balasters, and thin lead lights in the front door instead of wood bars, as in the rest of the house. The plan has the serious blemish of having the larder lit and ventilated on to the lobby for the coals and water-closet; in a block with only two houses this could certainly have been avoided. The external appearance is good, the tiles a brindled colour and not too regular, the wall not broken up into several divisions, and the back as well thought out as the front.

Nos. 13 and 14 are rather more interesting on plan than Nos. 15 and 16, with the same arrangement of coals and water-closet, but the larder properly ventilated. The plan is of the long, narrow type, with the living-room the whole width of the house, and lit from each end, and the general arrangement is similar to the prize design at Letchworth. The elevations, though quiet, are commonplace, and the roof is of perfectly regular pinkish tiles.

Nos. 1, 2, 3, and 4 form a block, faintly recalling one of Mr. Geoffry Lucas's, but the brickwork is hard and unsympathetic, and set in black mortar, and the windows badly divided up by bars. The plans are not interesting, and have the stairs facing you as you enter. The larder to the two central houses are placed in a semi-basement under the stairs, with an awkward squint to give it light and ventilation by means of a grid on the ground level. In this case both scullery and living-room have been given a range, which seems rather an unnecessary initial expense for such small houses, as the natural thing would be to have a gas-stove in the scullery if it was desired to do the cooking there rather than in the living-room, so as not to keep two fires going.

Nos. 32 and 33 are the most unusual plans in this class. The cottages are roofed with a mansard something like Nos. 5 and 6, but much better done, with a central square chimney-stack set on the diagonal. The architect has wisely built them of a common brick and whitewashed, but he has, unfortunately, left patches here and there red, and a very bad red too, which quite destroy the restful look of the outside. The slates are good in texture, but bad in colour. The front door opens in rather an intrepid manner on to the water-closet and coals, and the passage leads past the scullery into the living-room. When once the visitor has passed these perils, he can see why it is done, as the sitting-room is a well-shaped symmetrical room with a French window opposite the entrance, looking towards a magnificent view. If, however, another house were built to block out this view, the whole reason for this daring scheme would be lost.

Nos. 41 and 42 also have an ingenious plan with a "joggled" party-wall and stairs neatly contrived. The exterior has the bad effect of looking like a single villa instead of two cottages. In reality it does not look so well as in the drawing in the catalogue. The whitewash, instead of going down to the ground, only goes to the head of the ground-floor windows. There are no bars in the windows, and the bargeboards and moulded woodwork in general are of a very cheap nature.

Nos. 17, 18, 19, and 20 are a quietly-designed block, with the same larder fault as Nos. 15 and 16, but having 11-in. cavity walls they are faced with stretchers only, and these "tuck-pointed," which gives the whole block a strange appearance of cardboard unreality.

In Class C Nos. 34 and 36 (with a cottage in Class B between them) are the best, both as regards plan and external appearance. The design, *per se*, is perhaps the best in the exhibition, though it has grown up rather high in the middle, but it has no quality of the North Country about it, and it is evidently the work of midland architects who have not adapted themselves to the different surroundings. The bricks, as the architects say, are the best that could be obtained locally, and certainly it is the best brickwork in the exhibition; but that is not saying much, and we are surprised that they did not use the local stone.

Nos. 7 and 8 are pretentious in design, with some rather ugly panels of rough-cast enclosed in ugly brickwork. The parlour is an amazing room, with a square window on one wall, and an oval one nearly as large and filled with grotesque stained-glass between the wood bars on the other, and an angle fireplace. The architect has purposely kept this parlour very small, and we imagine he has as purposely rendered it uninhabitable, knowing it would be the repository of funeral cards and wax fruits. The rest of the plan is good. The main living-room is large and airy, and has a front aspect, and he has very wisely, in a house of this size, made a separate bathroom upstairs, though it is placed rather a long way from the living-room range. In this case a range in the scullery as well as living-room seems justifiable.

Nos. 30 and 31 are villa-like in appearance and villa-like on plan, with the living-room, in which the family would spend all their time, looking direct on to the coal-shed and water-closet.

Nos. 37 and 38 are not nearly finished, but they make some attempt on plan, with a living-room the full width of the house. The outside, however, is altogether too deplorable for serious consideration.

INTERNATIONAL CONGRESS ON SCHOOL HYGIENE.

THE second International Congress on School Hygiene, held at the London University this week, has proved to be one of the largest and most important conferences ever held. In all, eleven sections have been sitting each morning, and the well-being of school children has been discussed from almost every possible point of view.

Section XI. dealt with "The School Building and Its Equipment," and the sittings commenced on Tuesday morning in the Central Technical School under the presidency of Mr. T. E. Collcutt (President R.I.B.A.). The secretaries of the section were Mr. J. Osborne Smith, F.R.I.B.A., and Dr. Kaye.

The President, in opening the sitting, said that in view of the papers to be read he would only touch on certain points which struck him as an architect as being of some interest. In designing school buildings the architect was generally obliged to limit his expenditure, so that there were seldom opportunities for much ornament or display. This in itself was not a disadvantage. There was no necessity for elaboration of design, but fine architecture was always desirable, and it was quite possible without rich and expensive detail. In every school building, however simple in general construction, there should be at least one feature of architectural worth. Should this be a fine doorway or any other detail, let it be good enough to be a source of pride to the school. An important factor in education was the development of that appreciation of beauty in art or nature which was latent in most of them. If school teachers could learn to be proud of some part or feature in their building they could probably inculcate some such feeling in their scholars. He believed that a sense of admiration for the handicraft of others led to emulation of the right kind, and a fine example in stone or woodwork might prove of great educational value to their budding craftsmen. Another point on which he should like to touch was the finishing of the walls in classrooms, etc. With all due deference to sanitary and hygiene opinion, he felt he must protest very strongly against the use of glazed surfaces in schools and classrooms. Perfect as glazed tiles were in every way when used in legitimate positions, for lining lavatories, cloak-rooms, etc., they were inappropriate and unsightly as wall-decoration for living-rooms. His own experience in a certain room lined with faience had been that of discomfort and irritation. Being, as they would allow, something of an expert where domestic architecture was concerned, he was able to trace the cause of his discomfort to the glaze of faience. Surely children, without knowing whence the depressing influence arose, might be quite as much affected by it. Too much stress could not be laid upon the importance of having warm and pleasant colouring upon the walls; the cold and drab colours which are so much used should be avoided. In London and large towns there was too much that was dismal and smoke defiled outside, and the interiors should be cheerful. Children's eyes wandered even when their attention was supposed to be engaged, and they should surely have something pleasant to look upon. Their schoolrooms, in fact, ought to be such rooms as we would not mind occupying ourselves. To illustrate his point he would draw attention to the "doss-house" in Parker-street, which he saw after it had been completed two years. This building was a common lodging-house for the poorest classes, the charge being 5d. a night for a bed. The common room was decorated in a way which might by many be considered inappropriate to the class of persons by whom it was used; but he considered that the money spent on beautifying had not by any means been thrown away. The whole of one end of the room was occupied by a carefully-designed fireplace surmounted by a mural picture; the woodwork of the walls and of the fixed seats was of equal merit with the other work, and was painted in rich and pleasant green. This sort of decoration, without being expensive, was highly effective. When they considered the exceedingly low charge for a bed and for the use of the room they would realise that the doss-house was occupied by the poorest of the poor. The casual occupant might be anyone from the young hooligan to the most hardened vagrant, and yet after two years of continual use he saw absolutely no sign of rough treatment. The painted woodwork and the walls were all in as good condition as if the room had been dwelt in by educated people. Any signs of wear visible were certainly not caused by malice or even carelessness. It seemed to him that the fact of this respect shown to a good building proved that even the minds of the very poorest may be accessible to feelings of beauty. If adults of the degraded, though not criminal, classes were sensitive to the influence of beauty, how much more must this be the case with the plastic mind of childhood. There was nothing more necessary to the well-being of children than good ventilation. Of all the systems at present in use, some of which were certainly excellent, not one could be said to approach perfection. In forthcoming papers they might hear of many methods strongly advocated, but he ventured to assert that whatever might be the virtues of such systems, all would leave something to be desired. Architects agreed that open fireplaces and open windows were essential supplements to any other kind of ventilation. All who had to do with children knew that they thrived best in the open air. Doctors insisted on open air for anæmia and chest disease and for minimising the risk of any sort of infection, and no system of ventilation had yet been discovered to supersede the open-air treatment for consumptives. If prevention was better than cure it behoved them to see that the children of the nation were taught as much as possible in fresh air. As a matter of example, it was desirable that children saw that frequent changing of the atmosphere was insisted on in the classroom. No patent system of ventilation would teach them the valuable lesson that they might learn by seeing the importance of having the windows open. As well teach them to cook by electricity and then let them go back to their own cheap stoves as expect them to learn the rudimentary hygienic truth that fresh air was essential in a classroom where the windows were all kept shut.

Swedish School Buildings.

Dr. Hagelin submitted the standard regulations respecting school buildings and public secondary schools in Sweden as prescribed by the State Secondary Schools Supervisory Board. The regulations provide that the services of a fully qualified professional architect should always be engaged for making designs of the buildings it is proposed to erect and for giving directions as to the constructive work to be carried out. In case of need, the Board of Public Works and Buildings is prepared to notify suitable architects for the purpose. The building work must be supervised while it is proceeding by competent experts. The position of school buildings must be an open one, the external walls of the structure being so placed that fresh pure air may have access to them from every quarter, and that the sun's rays may reach them during some portion of the daytime. The necessity for a due observance of strict simplicity and practical utility in the erection of school buildings should not prevent the endeavour being made to render the schoolhouse as a whole, and the several rooms in particular, pleasing to the eye, both in form and appearance, whereby there will be called up in the minds of both teachers and pupils agreeable and pleasurable sensations. The so-called corridor system is the most suitable for school buildings. There should not be more than three stories, exclusive of the basement. The best material of which to build schoolhouses is brick or stone. The regulations deal with the details of lobbies, staircases, corridors, doors, windows, floors, ceilings, walls, roofs, etc. Dr. Hagelin pointed out that this was the first attempt at legislation on the matter in Sweden, and no doubt improvements were needed. The regulations had been in force two years, and the experience so far was not very great.

Replying to a question, Dr. Hagelin said that there were regulations for elementary schools as well, and the principles were just the same.

Lighting of Schools.

Several papers were contributed in German dealing with the lighting of schools. Mr. Franz Pleier (Karlsbad), who opened with a paper entitled "The Angle of Light," remarked that photometrical investigations in schools were of doubtful value, and he advocated the measurement of places, explaining his own method of doing this.

Dr. Ruzicka (Prague) impressed on his hearers the necessity of so planning school buildings that light should penetrate into every place.

Other papers were read by Dr. Setler (Bonn) on "The Measurement of Daylight," and by Dr. E. Quirsfield (Rumburg) on "Results of Photometrical Investigations in Schools."

Mr. O. Fleming (London County Council), in proposing a vote of thanks to the readers of the papers, said that he felt that in the whole question of school design and arrangement the Germans were in advance of us. There was, however, a possibility of becoming almost too minute in their examination into the question of light, and an illustration of that was given by Dr. Setler, who pointed out in reference to a tree in the playground that the light measured in the winter was greater than in the summer owing to the absence of leaves from the tree. He felt that especially in London they could not be so exact. In the regulations which they had had placed before them by the Swedish State Schools Supervisory Board it was stated "the windows should admit light so abundantly that a normal eye is able to read ordinary-sized print in books at half a mètre off in any part of the room." He found he could do that in the room in which they were sitting, and as their schools were better lighted than that he could imagine that on the whole their London schools would comply with the ideal of the Swedish Committee, although he did not know how far they would comply with the data of their German friends.

Mr. J. A. O. Allan, in seconding the motion, remarked that the statements made as to the reflection of light were very interesting. Architects who were particularly concerned with school buildings should try and learn from their Continental friends as far as possible and try and draw an even line between excessive minuteness and what was often called "muddling through."

The resolution was carried, and the section adjourned.

[Our report will be concluded next week.]

INTERNATIONAL HOUSING CONFERENCE.

THE eighth meeting of the International Housing Conference was held in London at Caxton Hall, Westminster, under the auspices of the Permanent International Housing Committee and the National Housing Reform Council. On Monday the delegates, many of whom were foreign, were welcomed by Mr. John Burns, M.P.

At the first business sitting Mr. Alderman William Thompson delivered his Presidential address, in the course of which he said they had met to fight a common enemy. They waged a crusade against dirt, degradation, disease, and death; against darkness, foul air and foul water, with conditions of life which often made morality a miracle and common decency impossible, although these by no means exhausted the consequences of the body-blighting, soul-destroying effects of overcrowding and the slums. He believed they were all in entire agreement as to the need of a strong central body in every State to co-ordinate public and private enterprise more effectively than at present, to advise local authorities as to the best method of dealing with housing improvements, as well as to stimulate them in cases of neglect, and in the last resource to subsidise them if they failed to carry out the necessary work. They were all agreed that the new housing accommodation was insufficient in quantity, inferior in quality, or in many vital respects unsuitable in character; the place that should be occupied by cottages, for which there was a great demand, being filled by a kind of spurious villa which was not really wanted. It was therefore necessary to encourage some persons or authorities to increase, vary, and improve the supply of new and suitable dwellings. Let them hope in the near future to remodel their towns and substitute horizontal expansion with cottages and gardens, served by electric tramways for vertical extension, with badly ventilated or comparatively sunless block dwellings. In the meantime a substantial reduction of cost could be secured by simplification of building by-laws and production on a large scale, based upon a system of standardisation of the parts of the house, and adoption of new materials and economical designs. It was only recently that a concentration of effort had been devoted amongst architects to produce a really cheap cottage which shall be a desirable place of residence, and it was here that the Cottage Exhibitions did such useful work.

Housing Inspection, Slum Destruction, and Improvement.

Mr. J. H. Faber, one of the National Housing Inspectors of the Dutch Government, drew attention to the new law passed in 1901 establishing in Holland (1) a central Housing Department; (2) National Health and Housing Inspectors; and (3) Local Advisory Board of Health. Under the law municipalities may lend money to enable persons with small means to improve their property upon the direction of the local authority.

Mr. de Man touched on the new Dutch health and housing law, which up to the present has resulted in 802 dwellings being condemned. The State is empowered to lend money at a low interest to municipalities, or through their intervention to societies having specially in view the improvement or construction of working class dwellings. Thirty-three such societies have been helped.

Mr. Harold Shawcross (President of the Rochdale Housing Reform Council) pleaded for a more stringent enforcement of the law with regard to insanitary property, and strongly urged the desirability of building for those turned out of condemned houses.

The Land Question.

Dr. Wilhelm Merves (Dusseldorf), in a paper on this question, urged that a well-thought-out land policy was essential for all towns. Municipal land might be utilised in one or all of the following ways:—(*a*) Sold with registered conditions to prevent misuse or excessive speculation; (*b*) built on by municipalities as at Strasburg, Freiburg, and Scheveinfurt, where municipal dwellings are let; and (*c*) leased to individuals or companies, but preferably to societies of public utility. Three things should be combined in the process of town development, viz.: (1) Municipal land purchase of large areas; (2) a general plan providing for main roads and transit facilities; careful grading of districts in zones; varied streets and open spaces; reservation of front gardens for future widening of streets if necessary; (3) building by-laws varied according to zones, and providing for restrictions on intensive use of land, cheaper streets in suburbs and purely residential quarters, and bringing down of the regulations for small houses as to thickness of walls, height of rooms, and other details of construction.

House Building and Management.

On Tuesday Mr. H. R. Aldridge (Secretary of the National Housing Reform Council) read a paper on "House Building and Management," in which he made the special theme the superiority of the cottage as compared with the block dwelling. He pointed out that the block dwelling cost more per room, and was less healthy than the cottage, and did not give the maximum amount of encouragement to a healthy family life. There were two schools of housing reformers—those who said that private enterprise could not do right and those who said that public action was always bound to fail. The truth seemed to him to rest between the two extremes. Let private and public action stimulate and help each other. Dealing with the question of building laws, the speaker held that there was a strong case for the relaxation of the building by-laws in regard to the thickness of walls and the height of a room. On the latter point he thought 8 ft. 6 in. should be the minimum standard, and if adequate ventilation was provided no cottage room need be higher than this. The last word had certainly not been said in regard to the use of new materials and the inventive genius of man should be allowed greater play in the field of design of new and less costly methods and material. The use of these new materials must, however, be carefully watched, and if necessary checked. They might have a cottage ridiculously cheap in the first cost of construction, and terribly dear in cost of maintenance. The great need for amendment of the existing by-laws was, however, to be found in the conditions relating to the exterior of the house. There was not a Council in the kingdom equipped with by-laws which prescribed a proper minimum of space around a workman's house.

Papers were also read by M. Lucien Ferrand (France) and M. Vincent Magaldi (Italy) on "Housing Finance and Taxation."

METROPOLITAN WATER BOARD (CHARGES, ETC.) BILL.

THE consideration of this Bill, adjourned from July 23, was resumed in the House of Commons on Tuesday night.

Mr. Cooper (Bermondsey) moved on clause 3, "Incorporation of parts of Waterworks Clauses Acts, 1847," that the provisions with respect to communication pipes to be laid by inhabitants be not incorporated.

The amendment was negatived without a division.

On clause 9, "Rebates to be made in certain cases," Mr. Burdett-Coutts (Westminster) moved an amendment to the effect that the benefit of the rebate be given to persons assessed from 200*l.* per annum instead of 300*l.* as drafted in the Bill. He argued that the amendment would benefit a large class of shopkeepers and business men who needed a rebate more than persons assessed for business premises at 300*l.* per annum and over.

Mr. Rawlinson (Cambridge University), in seconding the amendment, said that the Bill as drafted would bear very hardly upon small tradesmen who deserved a rebate more than larger firms.

Mr. Barnard (Kidderminster) said the pro-

moters could not accept the amendment for financial reasons. It was impossible for the Water Board to give any more concessions.

Sir F. Banbury (City of London), in supporting the amendment, said that a deficit could be met by a rate-in-aid.

Mr. John Burns (President of the Local Government Board) said the amendment if adopted would have a serious effect upon the finances of the Water Board, and the inevitable effect would be that the poorer customers, those assessed at very much less than 200*l.* a year, would have to pay more than was proposed in the Bill, and if the deficiency could not be covered in that way a rate-in-aid would have to be incurred. He pointed out that the Committee which had considered the Bill had all the arguments before it and had heard witnesses on every point which could be raised. After most careful consideration, extending over many sittings, the Committee had decided that what the Water Board proposed to do in this matter was fair and equitable to everybody.

Mr. Courthope (Sussex, Rye) argued that the effect of the amendment would be altogether different from what was alleged by Mr. John Burns. What those supporting the amendment desired was that the rebate should not be confined altogether to the richest and largest firms.

Upon a division, the amendment was rejected by 184 votes to 24.

On the same clause Sir Frederick Banbury moved an amendment to the effect that the rebate or discount instead of being from 20 per cent. to 30 per cent. be 30 per cent.

The amendment was negatived by 173 votes to 20.

On clause 16, "Supply by Measure," Mr. Cooper moved an amendment to the effect that the charge for any supply furnished by the Board under the provisions of the clause shall be at the fixed rate of 8d. per 1,000 gallons.

The amendment was negatived without a division.

Upon the motion of Mr. Nield (Ealing), the following sub-section was added to clause 16:—"Provided always that if at any time after the expiration of five years from the passing of this Act the Council of any administrative county which, or any part of which, is within the limits of supply, or the local authority of any borough or district which, or any part of which, is within the limits of supply, shall make a representation to the Local Government Board that the prices authorised by this Act to be charged for a supply of water for domestic purposes or by measure ought to be altered, the Local Government Board, after such inquiry as they may think fit, may make an order varying the price which the Board may charge for a supply of water for domestic purposes or by measure, or substituting other prices in lieu thereof, and the prices so varied or substituted shall have effect on and after such day as may be mentioned in the order as if they had been stated in the Act, and the prices for the time being in force may be altered in like manner at any time after the expiration of any or every period of five years after they were last altered."

On clause 17, "Supply for Building Purposes," Mr. Bowles (Norwood) moved an amendment to the effect that a builder by giving notice in writing to the Board shall require them to furnish a supply instead of by measure, at a rate not exceeding 7s. per 100*l.* of the total probable cost of the structure after making reasonable allowance for decorative or iron or steel work not requiring the use of water. Mr. Bowles pointed out that the Bill as drafted provided that the Board might determine to do this, but he contended that his proposal was the fairer.

On the other side, it was argued that the Board might be relied on to treat builders fairly. They objected, however, for it to be made mandatory upon them to give a supply as suggested by Mr. Bowles.

The amendment was negatived without a division.

Mr. Cooper moved that clause 33, "Recovery of rates by action," be struck out of the Bill.

The amendment was negatived without a division.

Early on Wednesday morning, after a debate extending over several hours, the Bill passed through this stage, and was reported for third reading.

Builders' and Contractors' Column.

Workmen's Compensation.

The decision of Mr. Justice Warrington in the case *re* Winter German Opera, Ltd., seems to have an indirect bearing on the question which is now occupying the attention of all employers as to whether persons who are employed for their educational attainments will be deemed to be "workmen" within the Workmen's Compensation Act. The question in the above case was whether an operatic artiste was entitled to preferential payment under the Preferential Payments in Bankruptcy Act, 1888. The words of that Act are "all wages or salary of any clerk or servant in respect of services rendered to the bankrupt." The Court held that the artiste was a "servant" who was paid a "salary or wages in respect of services rendered." In coming to this conclusion, the Court referred to the further provision in the Act which includes in preferential payments "all wages of any labourer or workman not exceeding 25*l.*" This finding, although expressly limited to the Statute under consideration, would seem to throw some light on the attitude which the Courts may assume towards the definition of "workman" in the new Workmen's Compensation Act. This artiste, engaged to take important *rôles* in German opera, was held to be employed as a servant under a contract of service, and the Workmen's Compensation Act now includes "any person," except those expressly excluded, "who has entered into or works under a contract of service."

Government Building and Engineering Contracts.

Replying to a question raised by Mr. Trevelyan, Mr. Harcourt, First Commissioner of Works, states in the Parliamentary Papers that with a view to ensuring still further that the workmen employed by the contractors of this Department shall receive the accepted wages in their respective trades, the following clause has been drawn up and included in all the building and engineering contracts of the Office of Works:—

"The wages paid by the contractor to workmen employed by him on the execution of works shall be those generally accepted in each trade for competent workmen in the district where they are employed, and the contractor's wages books and time-sheets for all workmen, so far as they relate to this contract, shall be open to the inspection of the Commissioner of Works, or their representatives, at such times as they may think fit."

With regard to manufactured goods, such as furniture, the following clauses, designed with the same purpose, are included, as far as possible, in the Board's contracts:—

"Wages.—The wages paid in the execution of this contract shall be those generally accepted as current in each trade for competent workmen in the district where the work is carried out.

"Work in Factory.—The contractors shall undertake that all articles included in this contract shall be made in their own factory or workshop.

"Inspection of Work, Wages Books, etc.—The contractors' factories and workshops and the goods in process of manufacture, and also the contractors' wages books and time-sheets shall be open to inspection at all reasonable times by the controller of supplies or his representative."

In addition, the Board have provided in their contracts for specific building works, that:—

"The builder shall pay the workmen employed on the work at the building or on the site and not elsewhere."

A Distinguishing Feature of Concrete-steel Structures.

We never hear of cases where buildings of brick or stone, or structures of timber or steel, collapse during construction unless, indeed, there has been some exceptionally glaring blunder. Yet structures of the materials mentioned may contain elements of weakness in design, material, and construction, which are only revealed as the result of some unexpectedly severe strain, or of gradually developing defects. As a general axiom it may be taken that all ordinary structural materials except concrete already possess their maximum strength at the time of use, for in the present state of knowledge it is not safe to consider that any changes taking place with the lapse of time will be in the direction of increased resistance. On the other hand, concrete exhibits the distinctive feature of possessing practically no cohesive strength at the time when it is actually employed; it attains a fair measure of strength after hardening for two or three weeks; thenceforward its strength increases three or four fold when some twelve months have elapsed, with a further but steadily diminishing increase as time rolls on.

For these reasons the crucial period for concrete-steel structures is during the removal of the moulds and during the conduct of specified tests. Assuming the moulds to have been removed without mishap, it may be inferred that there is nothing seriously wrong, an opinion that can be regarded as being satisfactorily confirmed after the construction has safely carried a suitable test load, as the increase of strength with age will double the resistance of the structure in a few weeks or months.

Apart from the small bridge which failed in Paris during, or just before, the last exhibition, owing to improper design, we do not know of any concrete-steel structure that has collapsed after completion. All the mishaps that have occurred of late on the Continent and in America have taken place during construction, and, in most cases, the consequent loss has presumably fallen upon the contractor, for it is very seldom possible to bring the fault home to the designer, and even if that could be done the chances are that the contract conditions would clearly throw all responsibility upon the shoulders of the builder.

This brings us to the very important points that the building contractor must not fail to realise the distinguishing feature of concrete-steel construction forming the subject of this note, and that if he is wise he will take such precautions as shall enable him to pass safely through the critical time. Carefully-supervised construction, and judicious removal of the centring after the concrete has sufficiently hardened, will certainly obviate all risk, providing the working drawings are free from theoretical and practical defects.

Four Simple Tests for Portland Cement.

The following tests are suggested in the *Concrete Review* by Mr. W. Purves Taylor, of the Philadelphia Municipal Testing Laboratory, for the benefit of users whose consumption of Portland cement is not sufficiently regular and extensive to justify the purchase of testing apparatus, or who may not feel qualified to conduct the more elaborate tests applied in fully-equipped laboratories.

The tests in question are for soundness, time of setting, purity, and strength.

Soundness.—Make a ball of about 2 in. diameter of paste, mixed in the proportions of 8 oz. of cement to about 1½ oz. of water. Drop the ball upon a table from the height of 2 ft.; if it flattens more than half its original diameter the paste is too wet, and, if it cracks the paste is too dry. After one or two trials the proper consistency can be secured by the addition of more cement or more water as the case may be. Then make two balls each of about 2 in. diameter.

Next take a tin canister with a closely-fitting lid and fit into it a piece of wire netting bent so as to form a platform 2 in. above the bottom of the canister. Pour in sufficient water to cover the bottom of the canister to the depth of 1 in.; lay one of the cement balls upon the wire netting; put on the lid, and put the canister in a cool place. After the expiration of twenty-four hours fill the canister with water and, without replacing the cover, put it on a stove capable of boiling the water within about thirty minutes. Let the water boil for three hours, adding boiling water from a kettle or pan to make good the loss by evaporation, and then remove the ball.

If the ball remains hard and free from cracks the cement may be considered sound. On the other hand, disintegration and cracks suggest inferior and untrustworthy material.

Faults developed by boiling are sometimes

caused by the freshness of the cement, and a second test a month or so later may show satisfactory results, thus indicating that the expansion constituents have become hydrated and inert. But if the cement does not pass the second test satisfactorily it should not be used.

This is virtually the test introduced some fifteen years ago by Dr. Michaelis, of Berlin. In our opinion a better method is the hot-water test of the late Henry Faija, a process requiring no other apparatus than a simple form of hot-water bath.

Time of Setting.—Put the other ball in a cool place, where it is not exposed to any strong current of air. At the end of twenty minutes it should still be soft and pliable, damp on the surface, and should not feel warm. After the expiration of ten hours the ball should be dry, and hard enough to withstand a firm pressure of the thumb-nail without perceptible impression. If the cement begins to harden or to become warm in less than twenty minutes it is generally inadvisable to use it, because in practical work the process of setting will commence before the mortar or concrete can be moulded or otherwise used. As cement that sets too quickly frequently becomes slow-setting after storage for a few weeks, a second test may be applied to any material that does not appear suitable when first examined. Very slow-setting cement is disadvantageous owing to the necessity for delayed removal of the moulds and centring, and may lead to mishaps if the time required for hardening is not accurately gauged.

Purity.—Place a pinch of the cement on a small china or glass dish; pour upon it a 3 : 1 mixture of hydrochloric acid and water, using a quantity equal to about three times the volume of the cement.

Pure Portland cement effervesces violently for one or two seconds, and then forms a yellowish jelly; while natural cement and cement adulterated with limestone continues to effervesce for a longer time when acid is poured upon it. Adulterants, such as cinder and sand appear in the form of a sediment at the bottom of the jelly, and the presence of slag is shown by the characteristic odour of sulphuretted hydrogen.

Strength.—Without proper testing apparatus it is difficult to determine even with approximate accuracy, the strength of cement mortar. The following method, however, may be useful to the small user, and, although crude, is better than no test at all.

In the first place mould three or four prisms of the mortar exactly 1 in. square by 12 in. long. This can easily be done by the aid of a planed board and a few strips of wood.

After the prisms have been in a cool and damp place for twenty-four hours they should be removed from the moulds and seasoned in water for either seven days or twenty-eight days. Then test each of them by supporting the ends upon rounded strips of wood spaced 10 in. apart across planks resting upon two walls about 18 in. apart. Across the centre of the prism place a round piece of wood with a wire or cord fastened to each end for the suspension of an ordinary pail, the bottom of which should be an inch or two above the ground. Then pour sand into the pail until the prism breaks under the transverse stress, and ascertain the breaking-load by weighing the pail and its contents, together with the cord and cross-piece.

The approximate tensile strength of the mortar may be taken at ten times the breaking load so determined. If the average tensile stress of three specimens thus tested is less than 120 lb. at the age of seven days, or 180 lb. at the age of twenty-eight days, for 1 : 3 mortar, there is evidently something wrong with either the cement or the sand.

We may point out that the best course would be to make two sets of prisms and to test one set at seven days and the other at twenty-eight days, with the object of ascertaining whether the strength of the cement increases with its age. This is an important point.

While the foregoing tests may enable the small user to assure himself against unreliable cement, we strongly advise all builders and contractors who regularly employ this material to procure a set of testing apparatus and to make themselves familiar with the procedure recommended by the Engineering Standards Committee.

TEST OF FERRO-CONCRETE FLOORS.

Last month load-tests were conducted on the three upper floors of the Girls' Friendly Lodge, Belfast, which has been built by Messrs. McLaughlin & Harvey from the designs and under the general superintendence of Mr. H. A. Cutler, M.Inst.C.E., the City Engineer. The panels tested on the first, second, and third floors measured 23 ft. between the walls by 5 ft. 3 in. over one of the main beams, which, together with the floor-slabs, are built in accordance with the Mouchel-Hennebique system of ferro-concrete, the beams measuring 5 in. wide by 8 in. deep below the under side of the floor-slabs, and the latter being 3½ in. thick. Each floor was loaded with bags of cement to the weight of 6 tons, equal to the super-load of 112 lb. per square foot of floor surface, or double the normal load demanded by the specification. Instruments for measuring deflection were placed beneath the main beams upon which the loading had been placed. All arrangements for the tests were made by the assistant to the City Engineer. The maximum deflection measured was ⅛ in. at the middle of the first floor beam, and a few hours after removal of the load the beam regained its original form, thus demonstrating the perfect elasticity of the construction within the limits of stress involved. The maximum deflection under double the normal load was less than 1-2,000th of the span.

MISCELLANEOUS.

The British Flooring Company, Gray's Inn-road, London, W.C., have secured the contract for 600 yds. of mosaic paving at the Wesleyan College, Handsworth, Birmingham; for three large parquet floors, Wimpole-street, W.; and for wood-block floors for several houses at Hendon.

Fifty Years Ago.

FROM THE *Builder* OF AUGUST 8, 1857.

UNSANITARY CONDITION OF THE HOUSES OF PARLIAMENT.

IN the House of Commons last week, Mr. Adderley asked the First Commissioner of Works whether he had any plan for the prevention of the pestilential stench which came every evening into every window in the river front of the Houses of Parliament; and also whether there was any power to enforce better trapping of the drains, or a removal of the deposits of bones and other refuse on the opposite bank, or whether legislation for the purpose was necessary; or, if there was no redress, whether any plan had been suggested by which the stench might be shut out of the houses by closing all the windows on the river side, and admitting air from another direction.

To this appeal of the hon. gentleman, Sir Benjamin Hall replied that the drainage of the metropolis rested with the Metropolitan Board of Works; but since representations had been made to him as to the annoyance complained of by the officers of the House, he had that morning seen Mr. Gurney, and he said that the stench came from the open sewers, and that whether the windows were open or not the stench would be the same, owing to the abominable state of the sewers. Independently of that, Mr. Gurney said that the great Victoria sewer had lately *broken in* near Whitehall-yard, and that all the contents had been forced down to the Bridge-street sewer. The consequence had been that the blocking up of the Victoria sewer had augmented the pestilential state of the river. With respect to the offensive trades which had been complained of, he might state that the clauses which had been introduced into the Metropolitan Act had *been so modified as to be of very little use*. It was a most essential clause, and one by which the local authorities were empowered to deal with the nuisances; but the course which had been pursued by that House had had the effect of taking out of the hands of the local authorities all power in the matter, and the consequence was that they were now at the mercy of hundreds of persons carrying on offensive trades along the banks of the river, such as bone-boilers and the like, who, under the provisions of the Act as now constituted, might do what they liked without reference to the health of the metropolis; and he must say that his hon. friend who put this question was mainly instrumental in making the alterations in the clause in question. The latter part of this statement was received with laughter, in which, if the matter was not so serious, we should feel inclined to join; but while we commiserate the present condition of our legislators, we cannot but remember the thousands in London—some poor and helpless—who are poisoned by bad drainage and the deposits of bones and other refuse.

We trust that the evil sanitary condition of the Houses of Parliament will soon meet with a remedy, and that upon the principle that "A fellow-feeling makes us wondrous kind," an experience of the disagreeable consequences of bad sanitary arrangements may cause the makers of the laws to pass more stringent and useful measures.

Illustrations.

UNITED KINGDOM PROVIDENT INSTITUTION, STRAND.

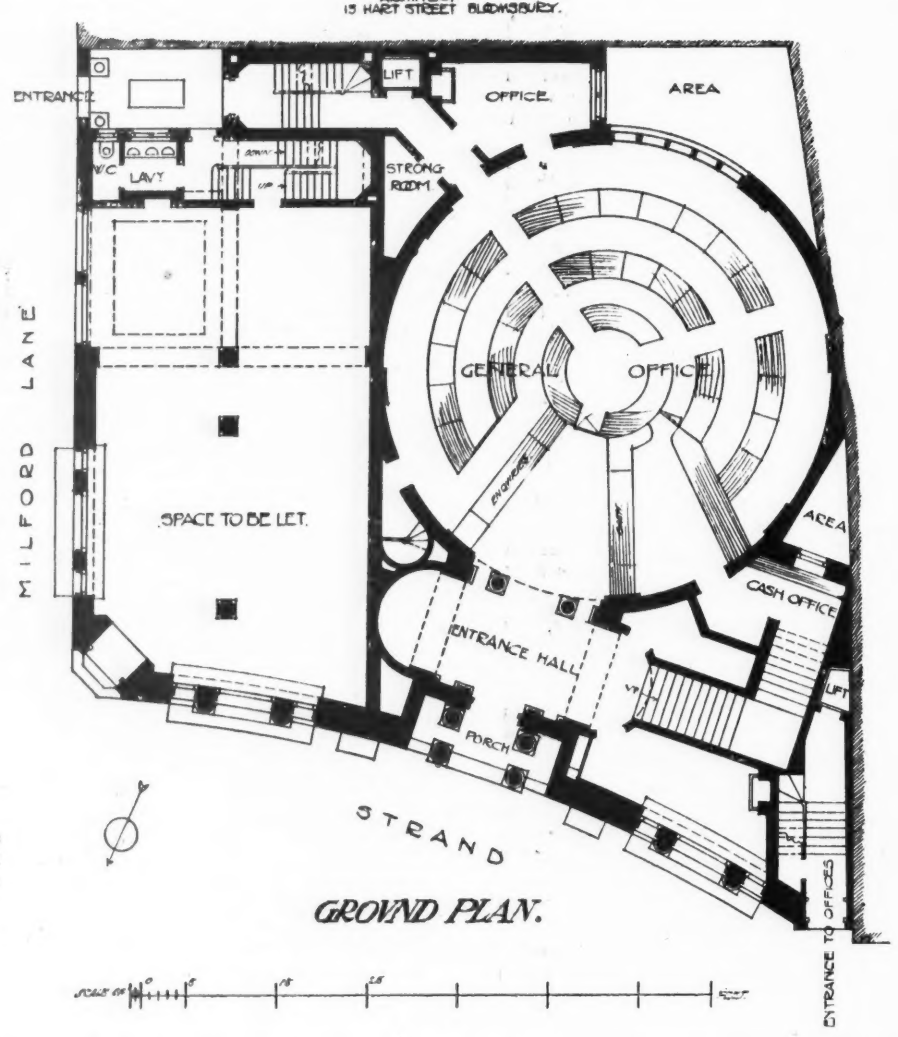
THE new premises in the Strand for the United Kingdom Temperance and General Provident Institution were opened last month by the Right Hon. H. H. Asquith, M.P.

The site was somewhat hampered by restrictions arising from the rights of adjoining owners in the matters of light and air. The irregular shape of the site and the concave curvature of the frontage also presented considerable difficulties in the planning of the building.

The main entrance is in the centre of the frontage, and has a recessed porch which is enclosed, when the office is not open, by bronze sliding-gates. The outer doors are also sheathed with bronze. Immediately inside the entrance is a vestibule with a vaulted ceiling covered with vitreous mosaic, in the central compartment of which is a circle depicting the signs of the Zodiac, while on the tympanum facing the entrance is a decorative mosaic by Professor Moira representing "St. George and the Dragon." The walls and floor are lined with Greek and Swiss Cipollino marbles, while the capitals of the columns, frieze, etc., are in Ormolu. The general public office is a circular apartment, 50 ft. in diameter, and is covered by a flat dome finished in mosaic and lighted by a circular skylight 18 ft. in diameter. Like the vestibule which leads into it from the main entrance, it is designed and decorated in the style of the First Empire. It is lined entirely with marble and mosaic, a scheme of green, purple, and white, relieved with the mat gold and burnished glitter of the Ormolu bronze parts. Eight green Cipollino marble monolithic pilasters divide this hall into eight bays, and ribs of the same marble carry the line up to the central light in the dome, which is framed with a great bronze laurel-roll edged with Cipollino marble. This roll is intersected at the junction with the ribs with cross ribbons, from which are suspended eight bronze electroliers. A frieze, 5 ft. deep, runs around seven bays, the eighth being occupied by a large stained-glass window by Mr. J. Dudley Forsyth. This frieze has a white statuary marble background on which are Ormolu bronze figures in high relief, while continuity of effect is obtained by the large bronze panels on the pilasters at the same level. These panels at the same time act as grilles for the radiators and fresh-air inlets. The door architraves, the radiator frames, the skirting, and the bases and capitals of the columns are also of Ormolu bronze richly chased. The sculptured frieze of the general public office is by Mr. F. Lynn Jenkins.

The main staircase, leading from the entrance to the first floor, is lined entirely with Cipollino and Pavonazzo marble, with cornices and enrichments of bronze. It is lighted by two windows filled with stained-glass by Mr. Dudley Forsyth, the first representing "Providence, our Instructor," and the second "The Light of Truth." Halfway up this staircase is a second small waiting-room.

The walls of the upper hall are lined with marbles, and the ceiling is vaulted and treated with gold. There are two windows, both of which are filled with stained-glass by Professor Moira. The doors opening on to this landing are of Spanish mahogany with figured panels.



GROUND PLAN.

The principal room on the first floor is the board-room. The walls are lined entirely with wainscot panelling, and the ceiling is of modelled plaster work. The central compartment of the ceiling is filled by an oil painting by Professor Moira, the subject being an allegory symbolical of Providence protecting Childhood, Chastity, and the Fruits of Abundance from the Evil Powers.

Adjoining and communicating with the board-room is a private room for the managing director of the Institution, and also smaller rooms for the proposal clerk and medical officer. All these rooms are panelled in wainscot, and the last-mentioned room has a small laboratory communicating with it. On this floor and the floors over the rooms of the south wing are for the heads of departments and their clerks, and on the top floor is a residence for the caretaker. In the windows of the rooms on the first floor are the coats-of-arms of each of the counties of the United Kingdom and several of the principal cities in them.

The basement consists of two floors containing strong-rooms, clerks' cloak-room, and lavatories, etc.

The upper portion of the front block above the first floor level is occupied by suites of offices for letting, and is approached by a separate entrance, staircase, and electric lift from the Strand.

The frontages of the building are entirely faced with Portland stone, and portions are enriched by sculpture. The figures in low relief on the second floor level are by Mr. F. E. E. Schenck, the subjects being "The Virtues." On the angle-turret the two figures represent "Watchfulness" and "Benignity." The group over the angle-window on the first floor represents "Prosperity." Over the main entrance the two figures are "Temperance" and "Providence." Over the east window "Justice" and "Truth," and over the west window "Security" and "Industry." All these are by Mr. Poole.

The architect of the building was Mr. H. T. Hare, and Messrs. Higgs & Hill were the contractors.

WROUGHT-IRON GATES, CHISWICK.

THESE illustrations of two old wrought-iron gates at Chiswick are from drawings by Mr. Maurice S. Adams (son of Mr. Maurice B. Adams).

Information about the work is sufficiently supplied in the memoranda in the corner of each drawing.

METROPOLITAN ASYLUMS BOARD.

AT the fortnightly sitting of this Board on Saturday last week the following matters were dealt with.

Eastern Hospital.—A plan was submitted for the provision of an entrance to the nurses' quarters at the Eastern Hospital, which it was resolved to forward to the Local Government Board for their sanction.

Quantities Forming Part of Building Contracts.—A report was submitted by the Works Committee with regard to the following resolution, passed in 1898: "That, provided the surveyors be required to guarantee the accuracy of their quantities, the bills of quantities form part of the contract in all future building contracts." The representations which had been made had led the committee to review the whole position and to consider whether it was in the interests of the managers that the bills of quantities should continue to form part of the building contracts carried out for the Board. After due consideration of the various points which were urged both in support of and against the practice at the time the Board decided on its adoption, and in view of the experience gained during the past eight years, they were emphatically of opinion that the disadvantages of the system outweigh what had hitherto been supposed to be its advantages. The most serious objection to the existing system was the absence of finality. Where quantities did not form part of a contract a builder knew that he had to erect the building or carry out the work according to definite plans and specification, and for a specific price; whilst in cases where bills of quantities formed part of the contract it was always open to the contractor to raise claims upon all items which were short, and to say nothing of those which were full, although the latter might perhaps more than balance the former. Again it was possible that quantities might or might not actually represent what was contained in the drawings and specification, but this could not be ascertained until the work had been completed, when in the case of any dispute the work had to be remeasured; so that the fact of bills of quantities forming part of the contract practically amounts to this, that the contractor was working under a schedule of prices, and that the original contract sum was only an approximate estimate. There were other and obvious objections to the practice of making the quantities part of the contract which it was unnecessary to particularise, and as they were convinced that the practice which now obtained had no special advantages for the Board they had no hesitation in advising the managers not to act further upon their resolution of November 5, 1898.—Agreed.

Constructional Steelwork.—In the specification for the new central stores it is provided that the constructional steelwork to the floors, stanchions, and yard roof was to be executed by one of six nominated firms, and that the contractor will not be allowed to execute the constructional steelwork himself. An application has been made through Messrs. W. Aldwinckle & Sons, the architects, for the contractors, Messrs. Charles Wall, Ltd., to be allowed to carry out this section of the work themselves, and it was mentioned that the contractors had executed the steelwork for the Birkbeck Bank, the new Vauxhall Bridge, the tramcar shed at Poplar, etc.—It was agreed to vary the terms of the contract as requested.

Obituary.

MR. SAINT GAUDENS.—We regret to announce the death, on August 3, at his summer residence, Cornish, New Hampshire, after a long illness, of Mr. Augustus Saint Gaudens, the sculptor, in his sixtieth year. Mr. Saint Gaudens, the son of a French gentleman and his wife an Irish lady, was born in Dublin on March 1, 1848; his parents took him when an infant from Dublin to America. Having learned the trade of a cameo-cutter, he studied drawing at the Cooper Institute and the National Academy of Design in the United States, and at the Ecole des Beaux Arts in Paris, where he was a pupil of Jouffroy (1867); in 1870 he opened a studio in Rome, and there he sculptured his first notable work—"Hiawatha"; two years afterwards he went to New York, where he finally settled in or about 1880, and was assisted by his younger brother, Mr. Louis Saint Gaudens, a pupil of the Ecole des Beaux Arts, in some of his works. Mr. Saint Gaudens executed the equestrian statue of General Sherman at the entrance into Central Park, and the statue of Admiral Farragut, in Madison-square, New York; the statues of Colonel R. G. Shaw at Boston and Abraham Lincoln at Chicago, and a bust of President Garfield; a bas-relief of the Adoration of the Cross by Angels for St. Thomas' Church, New York; the relief above the principal door of the Public Library, Boston; "Diana" for the tower of Madison-square Garden; and "The Puritan" for Springfield, Massachusetts. Mr. Saint Gaudens sculptured the memorial to his intimate friend, Robert Louis Stevenson, which was erected in June, 1904, on the west wall of the Moray aisle, St. Giles' Cathedral, Edinburgh. It consists of a mural monument with a medallion portrait in high relief set in architectural framework, for which he received the commission in 1898; the completion of the work was delayed by the artist's ill-health, as well as by the difficulties he encountered in securing the required quality of the patina for the relief, which was cast in Paris. A fire in his studio in the autumn, 1904, practically destroyed his original work for the memorial statue of the late Mr. Parnell; but the head of the clay model was saved, and in July last the statue and the bronze decorative work arrived from New York and were sent to be exhibited in Dublin pending the erection of the shaft. At the thirty-seventh annual convention of American architects held in Cleveland, Ohio, in October, 1903, Mr. Saint Gaudens delivered an address—"A few words on Academic Training in Sculpture"—for which we may refer our readers to our number of October 24 of that year. He was elected an Honorary Foreign Academician, R.A., on January 9, 1906; he was an Officer of the Legion of Honour, and a Corresponding Member of the Institute of France; in 1900-1 he received special medals of honour in Paris and Buffalo, and was a member of the International Jury for fine arts for the Universal Exhibition, 1878.

WESLEYAN SUNDAY-SCHOOL, BOOKER.—A Sunday-school is being added to the Wesleyan chapel at Booker. The work is being carried out by Mr. J. T. Harris, of High Wycombe, from plans submitted by Messrs. Nash & Hooper, of High Wycombe.

Competition.

PROPOSED HIGH SCHOOL FOR GIRLS AT ST. ALBANS.—The Council of the St. Albans High School for Girls Company, Ltd., decided that the architect for the proposed new school should be selected by means of a competition, open to all local practitioners. As assessor they appointed Mr. C. R. Baker King, A.R.I.B.A., of 2, Dean's-yard, Westminster, the architect to the Church Schools Company, Ltd. The first premium of 25*l.* was won by Mr. A. L. Champneys, B.A., of 99, St. Peter's-street, St. Albans, the second award of 10*l.* being secured by Mr. Robert M. Godfrey, of Station-buildings, St. Albans, and Dallow-road, Luton. The buildings are to cost about 5,000*l.*

Correspondence.

THE MARBLE ARCH.

SIR,—Will you pardon my correcting the statement in your issue of last week that the Improvement at the Marble Arch which I ventured to suggest in 1905 to the authorities included the removal of the arch itself.

The essential point of my plan is to leave the arch in its present position. It was the Royal Commission on London Traffic that suggested that the difficulty of relieving the traffic at this point could not be overcome without the removal of the arch. F. W. SPEAIGHT.

BETHNAL GREEN MUNICIPAL BUILDINGS COMPETITION.

SIR,—With reference to "Non-Competitor's" letter on this subject, is it not somewhat unfair to the competitors that the President of the Royal Institute of British Architects should refuse to appoint an assessor, the probable result of the refusal being that the competitors will probably have one, if at all, in whom they cannot place complete confidence? Of course, the mistake the Council has made is that they did not approach the President of the Royal Institute of British Architects before inviting designs, but as they have otherwise attempted to act justly, the present position seems somewhat unjust; the payment of the successful competitor is a matter for himself, and if your correspondent had competed he would know that it is possible to design the building so that "the contingency of litigation is improbable."

The action of the Secretary of the Royal Institute of British Architects is very commendable, but after his unsuccessful effort to obtain an alteration in the conditions the writer considers the matter should have been allowed to rest, particularly as the official ban of the Royal Institute of British Architects has not been placed upon the London County Hall competition, where the successful architect will not only receive 4½ per cent. in place of the usual 5 per cent., but will be under the thumb of one of "the young men from Spring-gardens."

The writer hesitates to suggest that the leading men of the profession are anxious to compete for the larger building, and not for the smaller, but the conclusion forces itself upon him.

COMPETITOR.

THE DANGER OF USING RUSTY IRON IN REINFORCED CONCRETE.

SIR,—Many writers on reinforced concrete assert that there is no danger in using iron with a slight coating of rust; others emphasise the fact and cite experimental data to prove that a coating of rust is a distinct advantage, inasmuch as the chemical action between the concrete and rusty iron forms a coating of silicate of iron which not only protects it from rust, but also removes any little rust that may be on the iron when placed in the concrete. The presumable advantage is the greater adhesion of the two materials in consequence of the roughened surface of the reinforcement.

A vital point, which will in time make itself painfully apparent, is here entirely lost sight of. Suppose rusty bars (and they usually are rusty) are used in the construction of a beam and are properly seated in the stirrups at, say, twenty points along its length, each stirrup being from 1 in. to 2 in. in width, how is it possible for the above-mentioned chemical action to take place?

Obviously if the bars are properly seated in the stirrups, as they should be to be effective, the cement cannot reach the bar, and consequently no protecting coating of silicate of iron can be formed at these points, as is proved by the following experiment.

In May, 1906, being engaged in the construction of a large reinforced concrete factory, and designing others, I had reason to doubt the advisability of using iron even partially rusted. I therefore had inserted in a block of concrete a bar of iron covered with a slight coating of rust, firmly seated in a stirrup which was entirely free from rust, and its mill face undamaged and unscratched. Recently I have had the block broken up, and find at the point of contact between bar and stirrup that not only has the bar continued to rust, but the stirrup has commenced to rust also. It is obvious that in a few years the stirrup at least will be eaten through, with only one result. W. H. BROWN.

TRADE CATALOGUES.

SIR,—It may seem discourteous to mention it, but I have no doubt that many architects have been, like myself, the recipients of large, frequently useless, and insufficiently franked catalogues. When not *free* I now refuse to take such things in, having frequently found (after paying the excess) that they are descriptive of things I never want, and am not at my age likely either to experiment with myself or to cause my clients to do so.

Many of these catalogues, costly of production as they are, would be prized if sent to the *right people* (*e.g.*, those who really *want* them), but it would be well and save much trouble and inconvenience if they were either sent *free* to those to whom they are addressed, or, better, not sent at all till applied for.

E. SWINFEN HARRIS, F.R.I.B.A.

ABATTOIRS IN SOUTH AFRICA.

SIR,—In the foreign column of your issue of June 1, at the end of the South African jottings, in reference to Krugersdorp, it is affirmed that "these are the first approved abattoirs ever built in South Africa." The knowledge of your correspondent is evidently not sufficiently extensive to justify such a statement on his part. King Williamstown has been in possession of an "approved abattoir" for nearly a year, the cost of erection being about 3,000*l.* The Port Elizabeth Municipality has also recently completed a large block of abattoirs likewise inspected and approved by the M. O. H. for the Colony, and consisting of fourteen slaughter-houses for the use of butchers individually, and two pig slaughter-houses, where a charge per head is made for killing. Attached to each of the former are lairs, cattle and sheep pens, hide-houses, and skin-stores, a road 40 ft. wide dividing the two principal blocks. A special sewer has been constructed discharging into the sea at a point opposite to the site, which is situated at the northern extremity of the town, and at least half a mile from the nearest habitation with the exception of that occupied by the inspector in charge. A similar scheme on a smaller scale at the south end only awaits the settlement by the Council of the land question. The building work already completed has cost 10,500*l.*, the contractor being Mr. J. Davey, with Messrs. Lockerbie & Wilkinson as sub-contractors for the replete and up-to-date fittings. The Municipality has undertaken the extension of the water main, construction of approach roads, and the laying of the sewer, the whole being in the capable hands of Mr. A. S. Butterworth, A.M.I.C.E., Town Engineer, and under the immediate supervision of

E. GRUBB.

The Student's Column.

MODERN METHODS OF USING GAS.—V.

Domestic Lighting (continued).

INVERTED BURNERS.—Six years ago the inverted form of incandescent gas-burner was practically unknown, although attempts had previously been made to devise such a burner. But as soon as a fairly successful form of inverted burner was placed upon the market a great demand for it arose, and it is now probably as largely used as the upright form of burner. Its advantages over the upright burner are that it does not cast a shadow upon objects beneath it, the mantle is usually more uniformly incandescent, and the lamp as a whole has a more pleasing appearance. With some of the early forms of inverted burner it was found that soot was deposited upon the mantle and in the Bunsen tube of the burner, and that a disagreeable odour was emitted owing to imperfect combustion of the gas. These faults have, however, been overcome by successive improvements in the construction of the burner.

When selecting an inverted burner it should be remembered that the hot combustion products flow upwards, and that these products are apt to corrode any metal work with which they come in contact while in a strongly heated condition. In some early forms of inverted burner the gas tap was placed a short distance above the burner, and became so hot that it was impossible to manipulate it with the unprotected hand after the gas had been burning for some time. Also, owing to expansion of the metal under the influence of heat, it was sometimes found that the plug of the tap could not be turned. The air inlets of the Bunsen tube should be provided with a movable shutter or collar for regulating the amount of air admitted to the tube. The collar should have a locking device to prevent accidental alteration of its position. If the air inlets are immediately above the burner a deflector or shield must be interposed between the burner and the air inlets to prevent combustion products from entering with the air and to keep the air-regulator cool.

As an example of an inverted burner having little metal work exposed to heat, and having its air inlets and gas tap well away from the zone of heat, an illustration is given of Bray's reversible inverted burner (Fig. 7).

Fig. 7. A Reversible Inverted Burner.

Shades for Inverted Burners.—Some consumers have found that the shades used with inverted burners break more frequently than those used with upright burners. This has been due in some cases to the use of shades of bad design, and in other cases to an unduly large consumption of gas. In the latter the flame has become sufficiently large to pass outside the mantle and come in close proximity to the glass shade. An excessive gas consumption may be due to the pressure of the gas supply being higher than that best suited for the burner, and when such is the case the burner should be provided with a small governor. The writer's experience has been that shades break less frequently with inverted than with upright burners. The design and colour of the shade will vary in accordance with the individual taste of the consumer, and with the description of the room in which it is to be used, but no shade should be used which becomes so narrow at its lower end that the glass approaches within an inch of the mantle. The shade must be so loosely gripped by the metal holder or holding screws that ample room is allowed for expansion of the glass under the influence of heat. If the shade be tightly gripped by the holder when cold, the shade will probably break soon after the gas has been lighted.

Burners Suspended from Flexible Metal Tube.—The manufacture of flexible metal tubing which is cheap, durable, and gas-tight has assisted in making the inverted burner popular, for in place of the comparatively heavy pendants formerly used an inverted burner suspended from flexible tube may be employed, and this has a less ponderous appearance (Fig. 8).

In the construction of the flexible metal tube a little rubber is used to make it gas-tight, and it is therefore desirable to protect the tube from heat as far as possible. With this object it is usual to connect the

burner to a short length of ordinary metal tube, which in turn is connected to the flexible tube, as shown in the illustration (Fig. 8).

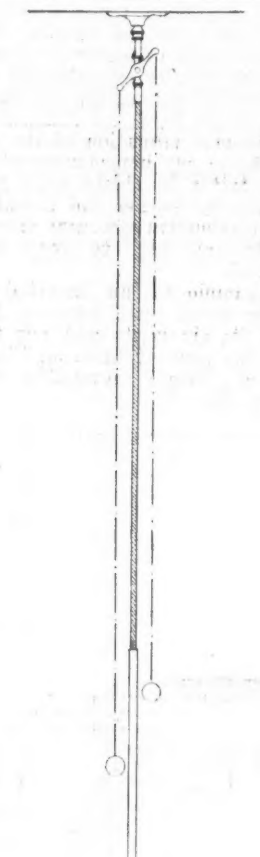


Fig. 8. Inverted Burner Suspended from Flexible Tube.

It is a matter of importance that the control tap should be placed at a point before the inlet to the flexible tube, so that should the flexible tube become defective no gas can escape from it when the tap is turned off. Heavy weights should not be suspended from flexible tube.

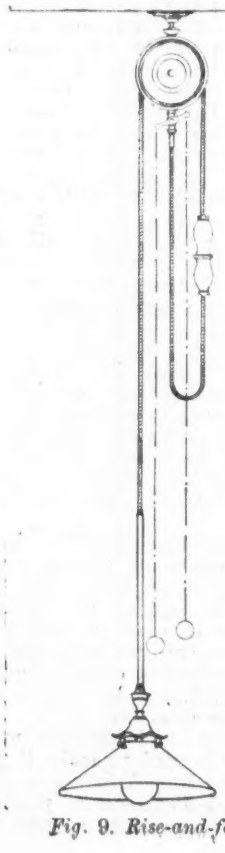


Fig. 9. Rise-and-fall Pendant.

Rise-and-fall Pendants.—The introduction of flexible metal tube has also made it possible to replace the objectionable water-slide chandelier with an inverted burner connected to flexible tube arranged around a pulley, and counterpoised by a weight, as shown in Fig. 9.

"Surprise" Pendants.—The form of pendant known as the "Surprise" pendant (Fig. 10) is more costly, but more substantial and more trustworthy than the flexible tube pendant. When attached to a "Surprise" pendant the burner can be raised or lowered, or swung round to any desired point, and the burner may be of the upright or inverted form. When used with an inverted burner the control cock may be fitted at the point shown in the illustration or at any other convenient point.

Rules for Domestic Lighting.—When calculating the number of burners to be provided in a room it is a common practice to allow 1 candle-power for every 3 sq. ft. of floor area. A room having a floor area of 360 sq. ft. would require, say, two burners of 60 candle-power each. The height of the room, and the colour of the surfaces of the walls and ceiling are factors which affect the amount of illumination obtained in the

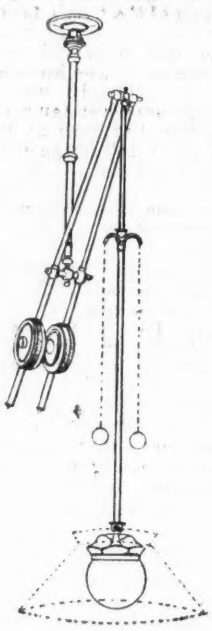


Fig. 10. "Surprise" Pendant with Inverted Burner.

room, and since these differ largely in different cases it is not feasible to enunciate a law for calculating the number of burners to be provided in a room. Also, individual requirements with regard to the provision of artificial light vary widely, and the purpose for which the room is to be used should be taken into consideration. Less light is required in a dining-room than in a reading-room. There is an ever-increasing demand for more brilliant illumination, and light of 1 candle-power for every 2 sq. ft. of floor area is often provided. Very brilliant lighting is apt to result in eye-strain and headache, and is strongly disliked by many persons. All mantles should be concealed from the eye by a shade of opal glass or other suitable material. About 25 per cent. of the light emitted by the mantle will probably be lost owing to the use of the shade, but allowance may be made for this when selecting a burner. No burner which consumes more than 4 cubic feet of gas per hour should be used in a room of ordinary dimensions. A burner consuming, say, 8 cubic feet per hour will emit great heat, and will blacken the ceiling above it more rapidly than a burner consuming less gas. The burner should be fitted as far away from the ceiling as is practicable.

NEW CHURCH, BRAEMAR.—The new church of St. Margaret of Scotland, at Braemar, was consecrated on the 3rd inst. by the Bishop of Aberdeen and Orkney, Dr. Rowland Ellis. The building was designed by Mr. J. N. Comper, who also designed the painted east window in memory of the late Queen Victoria.

General Building News.

ST. JOHN'S CHURCH, HOVE.—Owing to the growth of the town of Hove and increase in population, St. John's Church has recently been considerably enlarged, and a new Parish Room has been erected in connexion with same. The walls are of Bargate stone, with Doulting stone dressings to the windows, doors, etc., from the Chelynch beds of the Ham Hill and Doulting Stone Company. The architects were Messrs. Rogers, Bone, & Coles, of London, and the builders Messrs. G. Lynn & Sons, Brighton.

NEW CHURCH, NORWICH.—The foundation-stone of the church of St. Leonard, Thorpe Hamlet, was laid by the Mayor of Norwich (Mr. W. R. C. Howlett) on the 25th ult. The new church is situate on the top of Kett's Hill, and is being built by Mr. John Hurn from competitive plans by Mr. J. Owen Bond, architect. The church will consist of a nave, chancel, sanctuary, small baptistery, vestries, and offices. It will be built in brick, and half-timber and rough cast, with Broseley tiles for the roof. Inside there will be stained timber-framed roofing, and plaster walls. Seating accommodation will be provided for 400.

NEW CHURCH, MERTHYR.—The Bishop of Llandaff recently visited Merthyr and laid the foundation-stone of the new church, which is in course of erection there. The building will seat 570 people, and will consist of a nave, north and south aisles, south chapel, chancel, choir vestry, clergy vestry, and organ loft. The site slopes considerably from the street on the north to the south, and the space thus provided will be utilised for a church hall and space for classrooms respectively. The walls will be faced with stone, and the arches and jambs of windows formed of Ruabon red bricks. The principal feature of the building will be five-light traceried windows in the chancel and west front. The first contract is let to Messrs. Gough Bros., of Cardiff, for 2,300*l.*, and the completed church is estimated to cost 6,500*l.* Mr. Bruce Vaughan, of Cardiff, is the architect.

NEW CHURCH, FAZAKERLEY, LIVERPOOL.—A new church, to be known as Emmanuel Church, is in course of erection in this suburb of Liverpool. The building has been designed by Messrs. Ward & Cogswell, and the contract for the first part of the scheme has been given to Mr. Isaac Dilworth, of Wavertree.

CONGREGATIONAL CHURCH, WHADDON, NORTH BUCKS.—A new Congregational church is being erected in this village. The contract was secured by Messrs. Cripps & Sons, Winslow, who are carrying out the work from plans and specifications prepared by Mr. H. J. Coker, of Wolverton.

SUNDAY-SCHOOL, OVENDEN.—The memorial-stones were laid recently of a Methodist New Connexion Sunday-school at Ovenden. The new building, which is being erected on a site adjacent to the church, is to consist of an assembly-room and eleven classrooms, the whole giving accommodation for 350 scholars. Messrs. C. F. L. Horsfall & Son are the architects. The total cost is estimated at 2,300*l.*

NEW CHURCH, DODFORD.—The foundation-stone of a new church at Dodford, a village about two miles from Bromsgrove, was laid a short time ago. The architect is Mr. A. Bartleet, of London and Bromsgrove, and the builders are Messrs. J. & A. Brazier, of Bromsgrove. The building will be a little over 93 ft. long. There will be a nave and chancel and no side aisles; but there will be a south chancel aisle, and a south transept containing seats for children. At the end of the transept will stand a saddleback tower nearly 60 ft. high. At the west end of the church there is a small baptistery, and on the north side of the chancel there are two vestries (for choir and clergy). Above the choir vestry there is a classroom, and above the clergy vestry a minstrels' gallery opening and projecting forward into the church. The church will be lighted with acetylene gas, and warmed by hot-water pipes. The church will be built chiefly of local bricks, and it is proposed to cover the walls outside with rough cast, and inside with plaster. The window dressings, buttresses, and upper story of the tower will be of Bromsgrove stone. The wooden fittings and roofs inside will be of oak.

CHURCH RESTORATION, GUISBOROUGH.—The nave of the Guisborough Parish Church was recently re-opened by the Archbishop of York. The restoration of this nave has been completed at a cost of over 6,000*l.* The chancel, opened some time ago, was first taken in hand and restored at a cost of over 1,000*l.* In this portion of the scheme the ancient east window was removed and replaced by one of stained glass; the plaster was taken off the walls and oak choir stalls were erected. On completion of the chancel the work of restoring the nave was begun. The architect, Mr. Temple Moore, has retained as much of the original design as possible. The old roof has been completely removed, and the unsightly windows have been taken out. By the disappearance of the plastered ceiling the space in the interior has been increased. An

oak roof replaces the plastered one. Between each window buttresses have been erected. The ancient window from the chancel has been placed at the south of the tower, and at the north side of the tower a new window, similar in design to the southern one, has been placed.

CHURCH RESTORATION, BILLINGE. — The Bishop of Liverpool recently attended the Billinge Parish Church to lay the stone to commemorate the restoration of the church. The scheme consisted of the building of an addition to make up for the loss of accommodation that will be brought about by the taking away of the galleries to improve the sanitary conditions; and the alterations will incur a cost of about 3,800*l*. Mr. T. G. Jackson has been the architect of the work, Mr. J. O. Ellison being builder, and Mr. J. Blake clerk of the works.

WESLEYAN CHAPEL, RADCLIFFE.—A new chapel is being built for the Wesleyan body at Radcliffe Colliery. The preparation of the plans for the new building was put into the hands of Mr. William Burton, architect, Amble.

COUNCIL SCHOOLS, SOUTH SHIELDS.—The new Dean-road Council School has just been completed. The premises have been erected from plans prepared by the late Mr. J. Wardle Donald. The school is situated on a triangular plot of land one acre in extent. The main block is two stories in height, with additional rooms for special subjects on the second floor at each end of the building. The exterior work is carried out in Penshaw pressed red bricks, relieved with Heworth stone dressings, and the gabled roofs are covered with Welsh green slates. There are seven classrooms on the ground floor which provide places for 400 boys and similar accommodation is arranged on the first floor for an equal number of girls. Each department is provided with a central hall measuring 51 ft. long by 28 ft. in width. A handicraft centre for the boys and a cookery centre for the girls are placed in a detached building. The main contract for the work was let to Messrs. Stephen Sheriff & Sons, at the sum of 12,028*l*. Subsidiary contracts were entrusted to Messrs. Ashwell & Nesbit, Ltd., of Leicester, for the engineering work; Messrs. A. J. Wares & Co., South Shields, for electric wiring; and Messrs. Bennets, of Glasgow, for furniture. The general supervision of the completion of the contract was, upon the death of the architect last October, transferred to Mr. Henry Grieves, of South Shields. The total expenses will amount to about 16,500*l*.

SUNDAY-SCHOOL ENLARGEMENT, PLYMOUTH.—The Sunday-schools of the congregation of the Mutley Baptist Church, Plymouth, are being enlarged. The enlargement takes the form of a new lecture hall and school premises on the south side of the chapel. Mr. Ambrose Andrews is the builder, and Mr. F. A. Wiblin architect of the work.

GLASGOW ART SCHOOL.—The new Art School at Glasgow when completed will have, along Renfrew-street, a total length of 248 ft. and a depth of 77 ft. The existing eastern section is 56 ft. in height, but the roof is to be removed and an attic story added, giving a uniform height over the whole extent of the building of 72 ft. The frontage to Renfrew-street is a continuation of the design of the eastern section, but the western elevation to Scott-street will form a special feature. At the south-west corner of the building on the second floor the library is situated. Here the building rises to a height of 100 ft., and the wall will be broken by the library windows, 20 ft. in height, between which will he placed a series of emblematic figures, representing art, sculpture, architecture, and music. The basement floor of the building is set apart for the modelling school, and a series of technical studios for metal workers, wood carvers and enamellers, bookbinders, house decorators, etc., and there is a sub-basement, in which there are rooms for stone carvers, pointers, and casters. The modelling school measures 120 ft. by 48 ft., and has elementary, advanced, and life classrooms. Altogether, on the basement floor there is accommodation for about 200 students. The life modelling-room is lighted from the roof, and is 30 ft. in height. On the basement floor there is also a lecture theatre, seated for 150 students, with an independent entrance from Scott-street. On the ground floor are situated the still life and architectural schools. The ornament and still life classes occupy the corresponding floor of the eastern section, and this portion of the new section, which will accommodate about 200 students, will be set apart for the architectural school. Passing to the first floor, there will be here also a rearrangement of classes. The eastern section, when the building is completed, will be given over entirely to the antique school, and in the new or western section will be the life school, the school of design, a museum, a school library, with librarian's-room adjoining, and the headmaster's private room and studio. The life school measures 120 ft. by 35 ft., with a height of 28 ft., and it will accommodate about 150 students. It is lighted from the front, and it has also rooflights, the second or attic floor being recessed about 10 ft. to permit of this arrangement. The second or attic floor will be appropriated entirely for studios. In the new section there will be five private studios for professors, while in the old section over the existing building there will be nine studios for advanced students or for artists visiting the city. Classrooms for flower painting and composition will likewise be provided on this floor immediately over the library, and connected with these rooms will be a conservatory with light from the south-east. The plans were prepared by Messrs. Honeyman, Keppie, & Mackintosh, the work being carried out under the personal supervision of Mr. Mackintosh.

HIGH SCHOOL EXTENSION, LOUGHBOROUGH.—Sir Oliver Lodge recently opened the new buildings which have been added to the Girls' High School at Loughborough. The extension consists of a new block of buildings on the Burton-street frontage, and these are connected with the existing school buildings by a wide corridor. Additional accommodation, comprising a large assembly-hall with side corridors, 56 ft. by 36 ft., and two new and two reconstructed classrooms with three pianoforte practice rooms has been provided. On the first floor there are rooms for instruction in applied science and housewifery. The buildings are lighted by electricity throughout, and the present system of heating, which is by means of low-pressure hot-water, has been extended, and a new heating chamber and boiler provided. A laboratory block with modern appliances has been added. The total expenditure has been about 4,000*l*. The builders were Messrs. T. Barker & Sons, and the architects Messrs. Barrowcliff & Allcock.

NATIONAL SCHOOL, DRUMCONDRA. — The corner-stone of a new National School building, to be erected in Church-avenue, Upper Drumcondra, was laid a short time ago. The plans of the building have been prepared by Messrs. Bachelor & Hicks, and the builders are Messrs. Farmer Brothers. The cost of the building, furniture, and fittings will be about 1,000*l*.

SCHOOLS, BURY.—Plans are being prepared for the alterations and extension to the Technical School, estimated to cost 18,000*l*. The building will be used as a municipal secondary school, pupil teachers' centre, and technical school. Plans are also being prepared for a new Council school to accommodate 900 scholars. The plans are being prepared by and the work will be carried out under the supervision of Mr. Arthur W. Bradley, Borough Engineer and Surveyor, Bury.

POLICE BUILDINGS, SUNDERLAND.—The new Police and Quarter Sessions buildings at Sunderland have now been completed. At the front are three entrances for magistrates, police-court, counsel, etc. At the extreme north end is an entrance for the general public and the caretakers. On the ground floor are the police-station and cells, on the first floor courts, offices, witnesses' rooms, etc., and on the third floor are grand jury rooms, and inspectors' and caretakers' quarters. On Gill Bridge-avenue are the apartments of the recorder, clerk of the peace, magistrates' clerk, and the magistrates. To the west of the police-court is the court for Quarter Sessions. The lighting throughout is by electricity. The architects were Messrs. W. & T. R. Milburn, Sunderland, and Messrs. Wills & Anderson, London, and the builder, Mr. J. W. White, of Sunderland. The total cost of the work has been over 40,000*l*.

MUNICIPAL OFFICES, LEIGH.—The new Leigh Town Hall stands on a site of 1,882 sq. yds., and has frontages to the Market-place, Market-street, and Newton-street. The ground floor frontage to Market-street is occupied by nine shops, with basements under. The main entrance to the Town Hall is in the centre of the Market-place front by a projecting portico. The entrance hall is 45 ft. long and 22 ft. wide, and is enriched with Scagliola columns and pilasters with Ionic capitals. The ceiling is panelled and the floor is laid with black and white marble squares divided into panels with rouge and Parannazza marble borders. Entered direct from the main entrance hall, but with a second entrance from Newton-street, are the rates' office, the borough accountants' offices, and the assistant overseers' office, with a counter for the public to each department. These departments occupy a hall 52 ft. long and 34 ft. wide, being divided by glazed wood screen partitions. On the ground floor, and with additional entrances from Newton-street, are placed the offices for the officials and staff of education and school attendance departments and medical officer and sanitary department. The strong room for the various departments is placed in the basement, together with a number of offices. On the first floor are placed two committee-rooms, council chamber, mayor's parlour, and smoke-room, in communication with each other by a corridor 57 ft. long and 15 ft. wide. The council chamber and two committee-rooms occupy the whole first-floor frontage to the Market-place, and are arranged *en suite*, being divided by removable doors, so as to permit these three rooms (76 ft. long and 35 ft. wide) being used jointly. The council chamber has a gallery for the public, with accommodation for about fifty people. The mayor's parlour is entered direct from the corridor. On the same floor are five lighted rooms, forming the town clerk's department. On the second floor, fronting Market-street, are arranged the various offices belonging to the Surveyor's department, with several spare offices for any future extension of this department. The two main fronts to Market-street and the Market-place are in Darley Dale stone. Mr. J. C. Kestwich, of Leigh, was the architect, and Messrs. R. Neill & Sons, of Manchester, were the builders. The total cost of the buildings, including furnishing and decorating, is about 30,000*l*., or, including the cost of the land, 40,000*l*.

NEW OFFICES, ETC., LONDON.—Messrs. Holland & Hannen, of Bloomsbury, W.C., have recently been carrying out considerable building operations in London from the designs and under the supervision of Mr. R. Selden Wornum They are now engaged on the new offices for the Associated Portland Cement Manufacturers, which they are erecting in Lloyd's-avenue from the designs of Mr. Norman Shaw. These premises have fronts of Portland stone, which was supplied from the quarries of the Ham Hill and Doulting Stone Company, Ltd., and worked and fixed complete by them.

NAVAL BARRACKS, PORTSMOUTH.—As a result of the recent attempts at smuggling stolen goods, a new search-room has been erected at the Royal Naval Barracks, Portsmouth, by the Admiralty. It is built of brick with Doulting stone dressings, supplied from the Chelynch beds by the Ham Hill and Doulting Stone Company. This stone is the same as, and matches that, in the main barrack buildings erected some five years ago.

NEW VICARAGE, ASHFORD CARBONEL.—A new vicarage is being erected in connexion with the Ashford Carbonel parish church. The cost of the work will be over 1,500*l*., and Mr. Lloyd Oswell, of Shrewsbury, is the architect.

BUSINESS PREMISES, FOLKESTONE.—Alterations have been made to the premises at No. 68A, Sandgate-road, for Messrs. Gironemo's, Ltd., from plans by Mr. A. R. Bowles, architect. The electric lighting was carried out by Messrs. Marchant & Jackman; the wall decorations, etc., by Mr. E. J. Holden; the settees and similar fixtures by Messrs. Flashman & Co.; the furniture by Messrs. Plummer Roddis & Co.; and the general shop-fittings by Mr. Harrison Sheldon, of London.

PROPOSED SANATORIUM, SALTERLEY HEATH, NEAR CHELTENHAM.—Dr. H. Timbrell Bulstrode, Local Government Board Inspector, held an inquiry at the Council House, on the 26th ult., into the application of the Birmingham Corporation for sanction to borrow the sum of 17,000*l*. for the purchase of an estate called Salterley Grange, near Cheltenham, as a site for a sanatorium for consumptive patients. Mr. Ward, architect, gave evidence as to the expense of altering the mansion on the site for the purposes of an administrative block, which he stated would be small.

BUSINESS PREMISES, MAIDSTONE.—New premises are being erected for Messrs. George Leavey & Co., Ltd., in Mill-street, Maidstone. The architect is Mr. G. E. Bond, Rochester, and the builders Messrs. Elmore & Son, of Maidstone. The front is carried out in red pressed bricks, with Monk's Park stone dressings. The height to the eaves is 53 ft., and to the ridge 65 ft., there being five stories besides the basement. The cost of the whole building, including fittings and shop front, is about 5,300*l*. The lighting and other electric arrangements, including the lift, were carried out by Messrs. W. A. Hole, of Stratford. The shop fronts (designed, like the fittings by the architect) are the work of Mr. E. Pollard, Clerkenwell-road, and the grates and mantelpieces were obtained from Messrs. Edmund Vaughan & Co.

FREE LIBRARY, COLNE.—The new Carnegie Library which has just been opened at Colne is situated in Albert-road, and was formerly a family residence, being secured by the Corporation for the sum of 2,700*l*. The work of transformation has been accomplished under the supervision of the Borough Surveyor.

PROPOSED EXTENSION OF BLACKPOOL PROMENADE.—At a recent meeting of the Highway Committee of the Blackpool Corporation the Surveyor, Mr. J. S. Brodie, brought forward a comprehensive scheme which provides for the erection of baths in the bay between the North Pier and the Metropole, and for the promenade to be extended northwards to Claremont-park. The cost of the scheme will be about 70,000*l*.

Appointments.

BATTERSEA POLYTECHNIC.—The appointment is announced of Mr. W. E. Curnock, M.Sc., (Victoria), B.Eng. (Liverpool), as head of the mechanical engineering and building trades department. During the last three years Mr. Curnock has been head of the engineering department of Huddersfield Technical College, and was formerly chief assistant in the engineering department of the Northampton Institute, Clerkenwell.

JARROW.—The Jarrow Town Council have appointed Mr. J. Scott Weir, of Halifax, Borough Surveyor. Mr. Weir is assistant at the Halifax Engineer's office, and was formerly assistant at Tynemouth and Sunderland. There were 158 applicants for the post.

Sanitary and Engineering News.

VENTILATION OF SOIL PIPES AND DRAINS.—Dr. Sykes, Medical Officer of Health for St. Pancras, in his annual report just issued says that builders still continue to complain that they are allowed to put up a 3½-in. soil pipe and a 3½-in. vent pipe to ventilate a 4-in. drain, but that if they ventilate a 4-in. drain not having a soil pipe, but a branch water-closet drain on the same level, they are compelled to make the branch 4 in. diameter and the vent pipe 4 in. diameter. In other words, if the vertical pipe is the continuation of a 4-in. horizontal drain it must be 4 in. in diameter, but if to this vertical vent pipe a water-closet is connected it becomes a soil pipe, and may, together with the soil pipe, be reduced to 3½ in. in diameter. A soil pipe is a direct continuation and part of a drain, that portion which is horizontal being called drain, and that which is vertical being called soil pipe, so that a soil pipe is a vertical drain and should be subject to similar provisions. The anomaly was typically apparent in the case of the teacher's house at All Saints' School, Pancras-street, where the committee declined to take any action against the builder for putting up a 3½-in. ventilating pipe to the drain because the water-closet was on the basement level instead of the first floor. The continual irritation and annoyance caused by this anomaly is not experienced by the London County Council, but by the Borough Council, which is the executive authority; and he felt sure that the London County Council would rectify the wrong upon the representation of the sufferers, if sufficient pressure were brought to bear. A great amount of confusion and complaining would be avoided if a minimum diameter of 4 in. were adopted for soil pipes in By-law 11, paragraphs 5 and 2, or if a minimum diameter of 3½ in. were adopted for drains in By-law 4, paragraphs 3, 9, and 10, and for vent pipes in By-law 8, paragraph 4. One of these alternatives should be adopted.

DRAINAGE IN KENSINGTON.—The Public Health Committee of Kensington reported recently that their attention had been called to the fact that the use of drain-pipes 6 in. in diameter is now being largely superseded by that of pipes of 5-in. and 4-in. bore in draining and redraining premises in the borough, and the Committee had therefore thought it well to authorise the Borough Engineer to permit in such cases any new entries to the sewer to be constructed of the same diameter as the main drain. The Committee had also given directions that where an applicant so desired and is willing to pay the extra cost, the sewer entry drain may be carried out in heavy iron of the minimum size of 4 in.

A BRIDGE ACROSS THE OUSE, EAST RIDING, YORKS.—The West Riding County Council will contribute one-third of the cost, estimated at a total of 26,000*l.*, of the construction of a bridge at Booth Ferry, near Howden, for which the East Riding County Council are about to prepare a Bill to be introduced in the next session of Parliament.

PAVING WORKS IN WANDSWORTH.—At the last meeting of the Wandsworth Borough Council the New Streets Committee reported having had under consideration the question of the course to be adopted in future cases where materials already in the street are used in the execution of paving works. A joint report from the Council's Surveyors was placed before the committee in this connexion. It appeared the practice was formerly to allow for kerb found in a new street and used in the execution of the work; but in July, 1904, the Council decided that future estimates should provide for the purchase of all materials required in the making up of the street, and that the frontagers whose kerb, channelling, or stone paving is in the street be paid its value if it were used in the execution of the work. The subject was further considered in November, 1904, consequent upon a decision at the police-court, and it was resolved that these materials should not be regarded as the property of any special owner, and that future estimates should provide only for the actual materials and work required for paving the street. The effect of this was to reduce the total amount of the apportionment and to give all the owners in the street the benefit of any kerb, etc., there, although in some cases it was in front of only some of the property. The committee, having reviewed all the facts, had come to the conclusion that this practice is inequitable, and they therefore recommended that the resolution passed on the subject on November, 1904, be varied as follows, viz.: (*a*) In cases where paving, kerbing, or channelling materials are found throughout the whole length of the street provision be made in the estimate for relaying the materials only. (*b*) In cases where paving, kerbing, or channelling materials are found in part of the street only provision be made in the estimate for relaying the materials; that a provisional amount be inserted in the estimate equal to the estimated value of the materials, and that in the event of the materials being used in the execution of the work the estimated value thereof be paid to the respective owners if applied for before the account of the cost of the work is closed. The report and recommendations were adopted.

KINDER WATERWORKS.—In their report to the Stockport Waterworks Committee Messrs. G. H. Hill & Sons, engineers for the construction of the reservoir at Kinder for the Stockport Corporation, state that a wing trench will be required at the northern end of the embankment, and that there are several works which could at once be proceeded with, viz., the refilling of the trench with concrete, the excavation of the wing trench, and the driving of the discharge tunnel and the waste water-course. The committee have decided to authorise the engineers to proceed with the excavation of the wing trench on the northerly side of the embankment and to report further.

Foreign.

FRANCE.—MM. Blondel (Versailles), Bissuel (Lyons), and Lefort (Rouen) have been elected Honorary Presidents of the Association Provinciale des Architectes Français for 1907–1908. The acting President of the Association is M. Minvielle, of Bordeaux.——The new dock basin at Fécamp is to be prolonged to the extent of 160 mètres, at an estimated cost of 800,000 francs.——Important works in improvement of the Orléans Canal have been carried out, at a cost of six million francs.——It is proposed to build a new hospital at Denain, at a cost of 700,000 francs.——A new railway viaduct for the St. Nazaire railway is to be built at Nantes, at an estimated cost of 250,000 francs. It is also proposed to replace the Pont d'Orléans at Nantes, which unites the two quays, by a new steel bridge, at a cost of 300,000 francs.——An Asylum for the aged is to be built at Santec-Roscoff (Finisterre), at a cost of 300,000 francs.——M. G. Jeune, architect, of Nancy, has submitted to the authorities of that city a scheme for the formation of a large boulevard between the Boulevard d'Alsace-Lorraine and the Place St. Jean, crossing the railway lines by a bridge.——M. Couturier, architect, has been commissioned to carry out a new girls' school at Bourganeuf (Creuse), at a cost of 265,000 francs.——A competition has been opened, for architects of Angoulême, for the plans for a new Savings Bank, to be built on the Place Marengo and the Rue d'Aguesseau.——A new Museum of Decorative Art has been opened at Nantes, founded by M. Fougerat, Director of the Ecole des Beaux-Arts in that town.——M. Meysson, architect, has been commissioned by the Municipality of Rouen to carry out, at La Croix Rousse, an orphanage for boys, at an estimated cost of 414,000 francs.——A tunnel is to be formed, in the Department of Bouches du Rhône, for the passage of the canal from Marseilles to the Rhône. It will be 7 kilomètres long, 22 mètres wide, and 20 mètres high. A causeway 2 mètres in width will be formed at each side of the canal for the passage of an electric train. The cost of this work, which it will take seven years to carry out, is estimated at 34½ million francs.

Miscellaneous.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—The businesses of Rownson, Drew, & Co., of 225, Upper Thames-street, London, and the Clydesdale Iron Foundry Company, of 210, Upper Thames-street, have been amalgamated and registered as a company with limited liability, under the name of Rownson, Drew, & Clydesdale, Ltd., and both businesses will be carried on from the registered office of the company, 225, Upper Thames-street, London, E.C.

THE LONDON COUNTY COUNCIL ART SCHOLARSHIP EXAMINATIONS.—At the sitting recently of the Education Committee of the London County Council, the Higher Education Sub-Committee gave extracts from the reports of the examiners on the Art scholarship. Mr. Walter Crane reported that many of the exercises in painted decoration, schemes for stencilled pattern for walls, etc., still show great need for the cultivation of taste both in design and colour. The best examples, however, are greatly in advance of former years. A remarkably tasteful and well-executed set of examples of lettering both in painted sign-writing and script were shown by Horace H. Talbot, of the Blackheath-road London County Council school, to whom a 5*l.* exhibition was awarded, the same award being won by four other students of the Camberwell school, Northampton Institute, South-Western Polytechnic, and Westminster Technical Institute respectively, for various works. As regards the painted and stencilled work the examiners would like to see more experiment with frank and pure tints, and stencils on white or clear-tinted grounds. There is a tendency towards muddy, sickly, or dingy tints, which should be corrected. There was a good show of promising and painstaking work in the Architecture class. Drawing and painting were of very various quality, but on the whole showed much promise and evidence of earnest work, more especially in the artisan classes. The sets of drawings were numerous, and twenty 5*l.* artisan exhibitions were awarded. Stained glass was not a very large competition. The most original and striking design was a tinted glass panel with a full-length portrait, the figure being well conceived and characteristic, though the portrait was better in the cartoon than in the glass. In lead work there was a small show of no very special interest or variety. A 5*l.* exhibition was awarded to a candidate who showed a fairly good rainwater head. Mr. G. Frampton reports that the works, both in design and technique, sent in for the scholarships and evening exhibitions are in several cases distinctly above the average of those of last year. Two very fine pieces of wood-carving were submitted, the Gothic panel being very spirited, well designed, and splendidly cut. Also a word of praise is due to the plasterers for their models for ceilings and doorways, which are in advance of last year. In most of the work that touched upon architecture the advice of a skilled architect would have been of great advantage to the student during the setting out of his work before the final execution.

SCOTTISH NATIONAL CHURCH, CROWN-COURT, W.C.—Steps will shortly be taken to rebuild the exterior fabric of the church on the west side of Crown-court, Russell-street, Covent Garden. The site belongs to the National Church of Scotland. The old church was reconstructed in 1842 by R. Wallace, whose designs included the Norman stuccoed façade with two flights of stone steps on the outside, and were illustrated in the *Builder* of July 8, 1843. Six years afterwards H. Roberts enlarged and improved the church for Dr. Cumming, and built the adjoining schools.

HOMES OF CELEBRITIES IN LONDON.—Commemorative tablets are to be affixed to No. 19, Curzon-street, Mayfair, and No. 23, Hercules-road, Lambeth, and No. 39, Rodney-street, Pentonville, the home of John Mill the historian of India, and birthplace of his son John Stuart Mill. Lord Beaconsfield removed from No. 1, Grosvenor-gate, Park-lane, after the death, in 1872, of his wife, to No. 19, Curzon-street, where he died in 1881. William Blake was living in Hercules-road when he made the engravings for his "Gates of Paradise," and "Urizen," and for Young's "Night Thoughts"; he went thence, upon Hayley's invitation, to stay during three years at Felpham in Sussex. As the home of Coleridge in Berners-street, W., has just been pulled down a supplemental tablet will be added to the tablet recently set up, in order to record the rebuilding of the house—now numbered "71." The tablets erected in past years by the Society of Arts were inscribed "Lived Here," and in one instance, at least, those words were somewhat misleading to the general public.

CONSISTORY COURT OF LONDON.—At a sitting of the Court in St. Paul's, on July 26, Dr. Tristram, K.C., Chancellor of the Diocese, granted faculties in respect of the churches of St. Mark, Notting Hill, and St. Bartholomew, Islington. The faculty for the latter church, which was built in Shepperton-road in 1864, after E. Clare's designs in the Early English style, for 900 sittings, extends to the removal of the north and south galleries for an improvement of the lighting and ventilation, a rearrangement of the pulpit, font, and choir stalls, the building of a choir vestry in the south aisle, an extension of the chancel or construction of a side-chapel with a second Communion-table, and the removal of the organ from the west gallery into the north-east corner of the church. St. Mark's, Notting Hill, was built of brick in 1864, for about 900 seats, after E. Bassett Keeling's designs, in what he described as the "Continental Gothic" style, which he adopted for the Strand Music-hall. It is proposed to expend 2,000*l.* upon alterations and improvements, which comprise a reconstruction of the flooring, a new side-chapel with altar, a new font and pulpit, a fresh system of heating, and a general reparation of the exterior. The works will be carried out under Mr. Worsley's directions and superintendence. The learned Chancellor also agreed to issue a faculty for the removal, subject to the granting of a licence by the Home Secretary, of the remains of Bishops Bonaventure Giffard (*ob.* 1734) and his brother, Andrew Giffard (*ob.* 1714), from St. Pancras cemetery to a vault within the precincts of St. Edmund's Theological College at Ware, which was originally founded as the English College in Douai, by Cardinal William Allen, in the XVIth century, and was re-established at

Ware after the outbreak of the Revolution in France.

DUBLIN CATHEDRAL.—Just after the doors of Christ Church Cathedral, Dublin, had been closed for the night on Saturday the half-ton weight which supplies the motive power for the bells fell from the tower, owing to a steel rope snapping. The weight fell a distance of 60 ft., and struck the top of the arches over the choir, which were severely damaged. The Dean of the Cathedral and Sir Thomas Drew, the architect, were immediately informed of the occurrence. They advised that the services be suspended until the extent of the damage could be ascertained.—*Morning Post.*

THE SCOTTISH NATIONAL EXHIBITION.—The arrangements for the Scottish National Exhibition to be held in Edinburgh next year have made good progress. The plans, subject to any alterations which are deemed advisable, have been accepted, and work on the grounds and buildings will be commenced by the end of July or the beginning of August. In the accepted designs the industrial hall of 100,000 sq. ft. and the machinery hall of 20,000 sq. ft. are included in one large building, and everything both in connexion with the structures and the grounds has been framed with a view to charm the eye, and at the same time facilitate the commercial requirements. The classification of the various sections includes fine art, education and history, arts and crafts, mining, engineering, and metallurgy, transportation and motive power, shipbuilding and waterways construction, chemistry and scientific appliances, lighting, heating, and ventilation, manufactures and varied industries, agriculture, horticulture, and sylviculture, domestic sports and pastimes, botany and zoology, artisans' work, women's section, urban and rural improvements. All information can be obtained on application to the manager, Mr. W. H. Knight, 45, York-place, Edinburgh.

CRAIGIE MEMORIAL.—Mr. Alfred Drury, A.R.A., will execute a portrait, in the form of a plaque, of Mrs. Craigie, for the Memorial Committee, and a replica of the work will be sent to the United States.

TWO NEW LONDON CHURCHES, AND WIDENING OF OLD BROAD-STREET.—A portion of the site of St. Peter-le-Poer Church, which is now being pulled down, is reserved for a widening of the street; the remainder has been bought by the Anglo-South American Bank (the Bank of Tarapaca) for new premises. The proceeds, 96,000*l.*, of the sale will be devoted to the building and endowment of two new London churches —St. Peter-le-Poer and St. Benet Fink. The united benefice of St. Peter-le-Poer (Old Broad-street) and St. Benet Fink is now united with that of St. Michael, Cornhill. [St. Benet Fink Church gave way, in 1843, to Tite's Royal Exchange.

OLD BUSINESS PREMISES, CITY-ROAD, E.C.—The site of Messrs. Champion & Co.'s vinegar manufactory in the City-road, near the junction with Old Street-road, which covers two acres of ground, has been sold for nearly 100,000*l.*, and it is understood that the purchasers intend to appropriate the land to the erection of working-class dwellings. Messrs. Champion & Co., who have traded there during upwards of 200 years, have disposed of their business to another firm.

PETROLEUM AND LONDON SEWERS.—At the meeting of Hampstead Borough Council on August 1, a circular letter was received from the Chief Officer of the Public Control Department of the London County Council referring to the serious danger to life and property caused by the discharge of petroleum into the sewers, and recommending the provision of intercepting-chambers on the surface drainage of premises, forwarding a design of a satisfactory interceptor in use, and stating that such a provision was suggested as an addition to and not in substitution for the ordinary requirements as to drainage. The Borough Engineer reported in regard to the foregoing to the effect that his opinion was that a series of cast-iron chambers with circular-shaped bottoms, no less than two in number connected together on the siphon principle, ventilated, fitted with locking-covers, and constructed in a suitable position on the surface drain, would meet with ordinary requirements; while the cement-lined, rectangular brick chambers, as suggested by the Public Control Committee, would soon become foul if connected with water or soil drainage, are not easily cleaned, and would eventually become saturated with volatile spirit. He thought they were only suitable in connexion with factories or dye-works, where considerable quantities of naphtha or petroleum are used. The Council resolved to inform the London County Council of the foregoing opinions of the Engineer, also that it was the practice of the Hampstead Borough Council not to allow motor pits to be drained; further, to request the London County Council that all requirements to construct such or any interceptors or to make any alterations to the drain in connexion with motor garages be made subject to notices being given to the local sanitary authority.

A LARGE CANAL CUTTING MACHINE.—In the construction of the New York State barge canal, an excavating machine of unusually large proportions is now in employment. The apparatus comprises a steel truss 420 ft. long, mounted on towers 56 ft. high, designed to travel on tracks laid on either side of the canal bed to be excavated. A grab is provided for the removal of earth, and when harder material is reached the grab is loaded by aid of a steam excavator, material being discharged by traversing the grab along the truss towards either bank of the canal channel. The machine is operated by electric power, and only involves the staff of one operator in a cabin over the grab, six labourers and one foreman, in addition to the men required for the steam excavator. Apparatus of the kind can scarcely be remunerative for short lengths of canal channels, but for contracts involving construction or remodelling operations on an extensive scale it should be of considerable advantage.

A CONVERTIBLE OPERA-HOUSE.—The opera-house built by the municipal authorities of St. Paul, Minnesota, was designed so as to be equally useful for the purpose of theatrical representations and for employment as a meeting hall. The interior of the building provides an open space 300 ft. long by 172 ft. 6 in. wide without partitions other than a covered arcade extends around the sides, serving as a support for the balcony. Near one end of the building is a movable proscenium wall in two sections separated by a space 60 ft. wide. Each section of the wall can be raised vertically into the roof space when the hall is required for use entirely as an auditorium, and lowered to the floor for theatrical performances. The floor in front of the proscenium is provided with fixed seats, and the balconies along either side of this portion of the wall are pivoted, so that they can be rolled on wheel tracks and brought inward to join the movable proscenium wall. When the latter has been lowered and the balconies have been swung forward the house is divided into two parts, one for the stage and the other for an audience of 3,200 persons. With the proscenium wall raised and the balconies moved back the hall will seat 5,000 persons, in addition to affording space for some 3,000 chairs. Electric motors and hoists are employed for adjusting the moving parts of the building, the time required for conversion being about ten minutes. The designs were prepared by Messrs. Reed & Stem, architects, of New York, and the total cost of the building is stated at 90,000*l.*, exclusive of the site.

Legal.

WESTMINSTER ANCIENT LIGHT CASE.

THE case of Kerswill *v.* Farrer and others came before Mr. Justice Kekewich in the Chancery Division last week, when Mr. P. O. Lawrence, K.C., moved on behalf of the plaintiff to restrain the defendants until the trial from erecting certain buildings in York-road, Westminster, so as to obstruct the plaintiffs' ancient lights. He said the defendants were the freeholder, leaseholders, and building owners, and the freeholder had let the property for a long term of years. His Lordship the previous week had adjourned the motion to see if the defendants would give an undertaking. His learned friends who represented the defendants were willing to give an undertaking not to build so as to obstruct the plaintiff's lights pending the trial. The defendants' building was 40 ft. distant from the plaintiff's house, and it was already 60 ft. high, and the defendants had threatened to go up 80 ft., so their building already infringed to the extent of 20 ft.

After some discussion the defendants gave an undertaking until the trial in the terms of the notice of motion.

APPEAL BY CONTRACTORS.

THE matter of a Petition of Right of Frank Miskin, Ltd., came before the Court of Appeal, consisting of Lords Justices Vaughan Williams and Buckley, on the 24th ult., on the appeal of the petitioners from an order of Mr. Justice Sutton in Chambers.

Mr. Macmorran, K.C., for the appellants, said that the order objected to was one staying proceedings under the petition under sect. 4 of the Arbitration Act, 1889, on the usual grounds. He said the petitioners were a firm of contractors who had entered into a contract with the Admiralty for the execution of certain works at Sheerness, which were described in the contract as works for the construction of certain drains, manholes, a ventilating shaft, and outfall. That contract was dated November, 1902, and contained the usual arbitration clause, whereby all disputes under it were to be referred to a named person—the Director of Works. Very shortly after the works were started it was discovered that they could not be carried out in the way it had been originally contemplated they should be. The nature of the soil to be excavated was quite different from what both parties to the contract expected. Accordingly a fresh contract was entered into between the Admiralty and the petitioners to the effect that certain preliminary works were to be executed at an agreed schedule of prices, those prices being quite different from those mentioned in the original contract. The works were duly carried out, and then a dispute arose as to what sum the petitioners were entitled to in respect of those works. Two points were raised on the appeal, first that the petition was founded on a second subsequent contract, which was an independent contract from the original contract, and under which there was no submission to arbitration at all. If their lordships were against the appellants on that point their contention was that the Director of Works ought not to have the matter sent back to him to decide, as he was the arbitrator under the original contract, and he had substantially adjudicated on the matter. The petitioners claimed damages for breach of the old warranty, but the substantial claim was under the second contract, which contained various clauses, among them being a clause for extras which were to be paid for at certain rates which were attached to the original contract. The rates under the schedule of prices under the second contract were different altogether from those under the original contract. He submitted that the proceedings under the Petition of Right should not have been stayed by the learned judge.

Mr. Newbold followed on the same side. The contractors, he said, were perfectly willing to have the dispute referred to any independent surveyor their lordships thought fit to appoint as arbitrator.

Mr. William Wills having supported the order of the learned judge on behalf of the Admiralty,

In the result their Lordships allowed the appeal, holding that the second contract was independent of the original contract. They therefore allowed the proceedings under the Petition of Right to proceed.

BUILDING DISPUTE AT HINDHEAD: JONES *v.* BILTON.

THIS was an action brought by Messrs. Jones Bros., builders, of Chelsea, against the Misses A. and M. Bilton to recover the sum of 141*l.* 10s., balance of contract and extras for building a pair of semi-detached cottages at Hindhead.

Mr. Ruegg, K.C., appeared for the plaintiffs, and Mr. J. Samuel Green, K.C., and Mr. Johnson for the defendants.

The plaintiffs claimed the sum of 100*l.*, balance of contract, and 41*l.* 10s. extras, of which sum 22*l.* was paid into court, leaving 119*l.* 10s. in dispute.

The specification and contract provided that the buildings should be erected to the requirements of the Rural District Council and to the satisfaction of the defendants, and that the contract sum should be paid in instalments, the sixth instalment of 50*l.* to be paid when the houses were entirely finished, all town charges paid, and the houses ready for occupation, and the balance of 50*l.* three months after completion.

The defendants pleaded that the buildings were not completed in accordance with the specification nor to the requirements of the Rural District Council, that they were not liable for the sum of 19*l.* 10s. claimed as extras, and counter-claimed for the sum of 78*l.* 15s. for omitted works and 86*l.* 5s. for work and materials of inferior description and quality and not in accordance with the specification, and 16*l.* for loss of rent owing to the buildings not being completed within contract time.

Mr. Bushell (surveyor), Mr. A. Brown (architect), and Mr. F. A. Dodd (surveyor) gave evidence for the plaintiffs.

Mr. Frederic W. Hingston, architect and surveyor, Basinghall-street, E.C., gave evidence in support of the defence, and counterclaim as to the omitted work and the inferior description of the materials and labour in the buildings; and Mr. Edmund J. Harrison, architect, of Gray's-inn-square, W.C., gave corroborative evidence.

After a hearing lasting over four days and a half before the Official Referee, judgment was recently delivered.

The Official Referee held that the buildings were not completed in accordance with the specification and contract at the time the action was commenced, and therefore the builders could not recover the balance of their contract. As regards the sum of 19*l.* 10s. claimed as extras, he held there was no specific or implied contract by the defendants to pay the charges making up this amount. Judgment would therefore be for the defendants on all points with costs of the action and counterclaim.

APPEAL BY THE STEPNEY BOROUGH COUNCIL.

IN the Court of Appeal last week a considered judgment was delivered in the case of Gingell, Son, & Foskett (Ltd.) *v.* the Stepney Borough Council, on the defendants' appeal from a judgment of Mr. Justice Swinfen Eady.

The case raised the validity of certain orders for the regulation of the market made by the

LEGAL.—*Continued on page* 180.

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvii.; Auction Sales, xxviii.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Contracts.

BUILDING.

AUGUST 10.—**Macclesfield.**—HOSPITAL.—Macclesfield Corporation invite tenders for the various work required in the erection and completion of a proposed infectious diseases hospital, situate on the hospital land in Moss-lane. Plans, elevations, and sections may be seen at the office of the Borough Engineer, Town Hall, Macclesfield, where specifications may be seen, and a bill of quantities obtained, on a deposit of 2*l.* 2s.

AUGUST 12.—**Aldershot.**—REPAIRS TO SCHOOLS.—Aldershot Education Committee invite tenders for reports and work to be done at the several schools during the coming vacation. Full particulars, with specifications, can be obtained of Mr. Norman Clinton, Clerk, 4, Station-road, Aldershot.

AUGUST 12.—**Cowesby.**—ALTERATIONS, ETC., AT FARM BUILDINGS.—Works required in alterations and additions to farm buildings at Cowesby, for Mr. W. A. C. Lloyd. Bills of quantities and further information will be sent on application to Messrs. Jackson & Fox, architects, 7, Rawson-street, Halifax.

AUGUST 12.—**Montgomeryshire.**—SCHOOL ALTERATIONS.—Montgomeryshire Education Committee invite tenders for certain alterations and additions proposed to be carried out at the undermentioned schools:—1, Derwenlas Council; 2, Llanbrynmair Council; 3, Llanfyllin Council; 4, Trefeglwys Council; 5, Oakley Park (Llandinam) Council; 6, Pantmawr (Llangurig) Council; 7, Penygloddfa (Newtown) Council; 8, New Church-street (Newtown) Council. Plans and specifications may be inspected at the County Education Offices, Newtown, on a written application to Mr. Llewelyn Phillips, Clerk to the Education Committee. Applications for inspection must be accompanied by a deposit of 1*l.* 1s. Further particulars and information with regard to Nos. 1, 2, 3, and 4 can be obtained from Mr. R. W. Davies, architect, Carno, and Nos. 5 and 6 from Mr. E. Holford Mills, architect, Llanidloes, and 7 and 8 from the County Surveyor, Welshpool.

AUGUST 12.—**Winlaton.**—HOUSES.—The Blaydon Co-operative Society invite tenders for the erection of ten houses at Winlaton. Plans and specifications can be seen at the office at Blaydon.

AUGUST 13.—**Barnsley.**—SCHOOL.—The Governors of the Barnsley Girls' High School invite applications for tenders for the erection of a high school for girls on a site in Huddersfield-road, Barnsley. Applications, together with a deposit of 2*l.* 2s., should be made to the architects, Messrs. Buckland & Haywood-Farmer, Norwich Union-chambers, Congreve-street, Birmingham.

AUGUST 13.—**Belfast.**—STRONG ROOMS.—Belfast Guardians invite proposals for making a strong room, erecting a circular stair, heating clothing stores, and carrying out alterations at the Clerk's Offices, Workhouse, in accordance with the plan and specification prepared by Messrs. Young & Mackenzie, architects and engineers, Belfast. The plan can be seen at office of Mr. Joseph W. Robb, Clerk of the Union, Clerk's Office, Union Workhouse.

AUGUST 14.—**Carnarvon.**—SHOP FRONT, ETC.—New shop front, alterations, and additions to Messrs. Roberts & Owen, jewellers, 12, Pool-street, Carnarvon. Drawings and specifications may be seen at office of Mr. Henry Thomas, architect and surveyor, Castle-buildings, Carnarvon.

AUGUST 14.—**Glyn-Neath.**—HOUSES.—The erection of thirty (or more) houses at Glyn-Neath, for the Maesymarchog Building Club. Plans and specification may be seen at the offices of the architect, Mr. J. Cook Rees, Neath.

AUGUST 14.—**Hebden Bridge.**—HOUSE.—The erection of a dwelling-house opposite Oldtown Bowling Green, near Hebden Bridge. Plans may be seen, and bills of quantities obtained, upon application at offices of Mr. Thos. Kershaw, A.R.I.B.A., architect, Lancashire and Yorkshire Bank-chambers, Halifax.

AUGUST 15.—**Ballymena.**—BANK HOUSE.—The erection of a new bank house in Ballymena, Co. Antrim, for the Directors of the Belfast Banking Company, Ltd. Bills of quantities may be obtained from Messrs. W. H. Stephens & Sons, Donegall-square North, Belfast, on payment of a deposit of 2*l.* 2s. Plans and specification may be seen at office of Messrs. S. P. Close & Son, architects, Donegall-square-buildings, Belfast.

AUGUST 15.—**Cork.**—COTTAGES.—Cork R.D.C. invite tenders for building 155 labourers' cottages and fencing same number of cottage plots. Plans and specifications and tender forms for the works can be obtained from the Clerk to the R.D.C. on payment of 5s. A deposit of 5*l.* per cottage is required with each tender.

AUGUST 16.—**Bridgend.**—BUILDING NEW WINGS.—Building new west and east wings, at Court Colman, Bridgend, for Mr. R. W. Llewellyn. Plans may be seen, and bills of quantities and all particulars obtained, at offices of Messrs. Cook & Edwards, M.M.I.A., architects, Masonic-buildings, Bridgend, on deposit of 2*l.* 2s.

AUGUST 16.—**Walker.**—CONVENIENCES.—Newcastle-upon-Tyne Corporation invite tenders for the supply and fixing of floor, wall, and ceiling tiling at the Walker underground public convenience. Description, etc., can be obtained on application at the City Engineer's Office, Town Hall, Newcastle-upon-Tyne.

AUGUST 16.—**Watton.**—ALTERATIONS, ETC., TO CHAPEL.—The Trustees of the Wesleyan Chapel, Watton, invite tenders for alterations, additions, painting, etc., to the chapel and schoolroom at Watton. Plan and specification may be seen at Mr. C. Peck's, Watton.

AUGUST 17.—**Camborne.**—RESIDENCE.—The erection and completion of proposed residence at Camborne, for Mr. J. W. Lean. Plans and specifications may be seen by appointment at the residence of the proprietor, Wesley House, Camborne, or at the offices of Mr. Sampson Hill, architect, Green-lane, Redruth.

AUGUST 17.—**Croesfaen.**—RESIDENCE, ETC.—For building new residence, with stabling, etc., at Croesfaen, near Llantrisant, for Dr. Evan L. Davies. Plans may be seen, and bills of quantities and all particulars obtained, at offices of Messrs. Cook & Edwards, MM.S.A., architects, Masonic-buildings, Bridgend, on deposit of 2*l.* 2s.

AUGUST 17.—**St. Agnes.**—BUNGALOW.—The erection and completion of proposed bungalow at Mount Hawke, near St. Agnes, for Mrs. Collins. Plans and specifications may be seen by appointment at the office of Mr. Sampson Hill, architect, Green-lane, Redruth.

AUGUST 17.—**Southampton.**—SALE RING.—Southampton Corporation invite tenders for the construction of a sale ring, etc., at the Cattle Market. Plans, specification, and conditions may be inspected, and forms of tender and bills of quantities obtained, at the Borough Engineer's Office, upon production of the Borough Treasurer's receipt for a deposit of 2*l.* 2s.

AUGUST 19.—**Balby.**—SCHOOL.—The West Riding Education Committee invite tenders in connexion with the erection of a new school at Balby-with-Hexthorpe, near Doncaster. Plans may be seen, and quantities obtained, on application to the architect, Mr. F. W. Masters, St. Vincent, Doncaster. A deposit of 1*l.* is required. Cheques to be made payable to the West Riding Treasurer, County Hall, Wakefield.

AUGUST 19.—**Bishopmill.**—HOUSES.—All trades, in the erection of two semi-detached houses in West High-street, Bishopmill, for Mr. Wm. Ramsay, of Longmorn. Plans and specifications to be seen with Mr. R. B. Pratt, architect, Elgin.

AUGUST 19.—**Bont.**—SCHOOL BUILDINGS.—Montgomeryshire Education Committee invite tenders for the erection of elementary school buildings, offices, etc., at Bont, in the parish of Llanbrynmair. Plans and specifications may be inspected at the County Education Offices, Newtown, on written application to Mr. Llewelyn Phillips, Clerk to the Education Committee. Applications for inspecting plans must be accompanied by a deposit of 1*l.* 1s. Further particulars and information can be obtained from Mr. R. W. Davies, architect, Carno.

* AUGUST 19.—**Kingston.**—CHILDREN'S HOME.—The Guardians of the Kingston Union invite tenders for a children's home. For further particulars refer to an advertisement in this issue.

AUGUST 20.—**Treharris and Merthyr Vale.**—SCHOOL WORKS.—Merthyr Tydfil Education Committee invite tenders (1) for building new cloakrooms, latrines, and erecting folding partitions, etc., at Treharris Council Schools; (2) for alterations, erecting new latrines, forming entrances, asphalting playgrounds, etc., at Merthyr Vale Council School. Drawings may be seen, and copies of the specification and bill of quantities obtained, at the office of the Committee's Architect, Mr. J. Llewellin Smith, Central-chambers, for Nos. 1 and 2 separately, on deposit of 1*l.* 1s. each.

AUGUST 21.—**Coventry.**—REPAIRS.—Coventry Estates and Finance Committee invite tenders for the works required to be executed and materials supplied in connexion with certain repairs, painting, etc., to St. Mary's Hall (Contract No. 2). General conditions may be inspected, and specification and bill of quantities obtained, after payment of 1*l.* 1s. to the City Treasurer, on application to the office of Mr. J. E. Swindlehurst, St. Mary's Hall, Coventry.

AUGUST 21.—**Maesycoed, Pontypridd.**—SCHOOL.—Pontypridd U.D.C. Education Committee invite tenders for the erection of a school for the accommodation of 250 scholars. Plans and specification can be seen at the office of the Surveyor of the Council, from whom bills of quantities can be obtained on payment of a deposit of 5*l.* 5s.

* AUGUST 22.—**Aylesbury.**—SCHOOL EXTENSIONS.—The Committee of the Aylesbury Congregational Sunday Schools invite tenders for proposed extension of Sunday School and other works. For further particulars refer to an advertisement in this issue.

* AUGUST 26.—**Dartford.**—BAKERY.—The Dartford Industrial Co-operative Society, Ltd., invite tenders for the erection of a bakery. For further particulars refer to an advertisement in this issue.

AUGUST 27.—**Coedpenmaen.**—CHAPEL.—The erection of a Welsh C.M. chapel at Coedpenmaen, near Pontypridd. Plans and specification may be seen, and all particulars obtained, at the office of the architect, Mr. Philip J. Jones, 16, High-street, Tonyrefail.

AUGUST 28.—**Newbury.**—SCHOOL.—Newbury Education Authority invite tenders from builders residing within a radius of seven miles of Newbury for the erection of a new public elementary school, to accommodate 662 scholars. The drawings and specifications may be inspected at the office of the Borough Surveyor, Town Hall, Newbury, and a copy of the bill of quantities may be obtained from him upon payment of a deposit of 5*l.*

* AUGUST 28.—**St. Helens.**—NEW SCHOOLS.—The St. Helens County B.C. invite tenders for new schools in St. Helens. For further particulars refer to an advertisement in this issue.

AUGUST 30.—**Edmondsley.**—ALTERATIONS AT SCHOOL.—Durham C.C. Education Department invite tenders for alterations at Edmondsley Council School. Plans, specifications, and general conditions of contract may be seen at the office of the County Education Committee Architect, Shire Hall, Durham. Bills of quantities may be obtained from the Clerk to the Education Committee, Shire Hall, Durham.

AUGUST 31.—**Bangor.**—COLLEGE BUILDINGS.—The Council of University College of North Wales invite names of firms willing to tender for the proposed new college buildings. Applications (from which a limited number will be selected) should be sent to Mr. John Edward Lloyd, M.A., Secretary and Registrar, University College of North Wales, Bangor.

AUGUST 31.—**Manchester.**—GASHOLDER TANK.—Manchester Corporation Gas Committee invite tenders for a brick and puddle gasholder tank, 285 ft. diameter and 46 ft. 6 in. deep, to be constructed at their Bradford-road Station. Specification, etc., can be obtained on application (in writing only) to Mr. C. Nickson, Superintendent, Gas Department, Town Hall, Manchester, on payment of 5*l.* 5s. Drawings may be seen, the site inspected, and any other information obtained on application to Mr. J. G. Newbigging, M.Inst.C.E., at his office, Rochdale-road Station.

* AUGUST 31.—**North Wales.**—NEW COLLEGE BUILDINGS.—The University College of North Wales invite tenders for proposed new college buildings. For further particulars refer to an advertisement in this issue.

* AUGUST 31.—**Redhill.**—NEW SCHOOL.—The Reigate Education Committee invite tenders for an elementary school at Hooley-road, Redhill. For further particulars refer to an advertisement in this issue.

SEPTEMBER 1.—**London.**—CHAPEL.—A large Bible Christian Chapel, to seat 1,050, together with a block of classrooms and other buildings, at the corner of High-road, South Tottenham, London, N. Plans and specifications may be seen at the Bible Christian Book-room, Paternoster-row, London, or at the office of Mr. W. Beddoe Rees, architect, 3, Dumfries-place, Cardiff, from whom bills of quantities may be obtained on deposit of 3*l.* 3s.

NO DATE.—**Alvescot, Oxon.**—RESIDENCE.—The erection of a small residence. Plans and specification may be inspected at Alvescot Rectory. Further particulars from Messrs. Smiths & Marshall, Surveyors, Chippenham, Wilts.

* NO DATE.—**Avonmouth.**—CONVERTER-STATION.—The Bristol Electrical Committee invite tenders for the construction of a converter-station at Avonmouth, including ferro-concrete foundations. For further particulars refer to an advertisement in this issue.

NO DATE.—**Brampton.**—GRAND STAND.—The erection of a grand stand for Brampton Agricultural Show. For particulars apply Mr. T. W. Watson, Secretary, Stone House, How Mill, Carlisle.

NO DATE.—**Cardiff.**—OFFICES.—The erection of a block of offices on the corner of West Bute-street and Mount Stuart-square, The Docks, Cardiff. Names to Mr. Henry Budgen, F.R.I.B.A., 95, St. Mary-street, Cardiff, together with a cheque for 2*l.* 2s.

* NO DATE.—**East Ham.**—REPAIRS, ETC.—The East Ham Higher Education Committee invite tenders for repairing and redecorating the Pupil Teachers' Centre, Wakefield-street, East Ham, E. For further particulars refer to an advertisement in this issue.

NO DATE.—**Nairn.**—ALTERATIONS, ETC.—Alterations and additions to Achareidh House, Nairn. Applications for schedules to be addressed to Mr. W. B. Davidson, architect, 8, New-square, Lincoln's Inn, London.

NO DATE.—**Saintfield.**—SHOP.—Building a shop, etc., at Darragh Cross, near Saintfield, for Mr. Thos. Mageean. Plans and specifications may be seen at office of Messrs. Hobart & Heron, architects, 120 and 121, Scottish Provident-buildings, Belfast.

ENGINEERING, IRON, AND STEEL.

AUGUST 13.—**Dundee.**—TRAMWAYS.—Dundee T.C. invite tenders for (1) the construction of nearly one mile of double line of tramways; and (2) steel tramway rails, points, crossings, etc. Specifications,

schedules of quantities, and forms of tender may be obtained on application to Mr. Jas. Thomson, City Engineer, Municipal Offices, 91, Commercial-street, Dundee, on payment of 2*l*. 2s.

AUGUST 13.—**London.**—STEEL.—The East Indian Railway Company invite tenders for the supply and delivery of (1) mild steel angles and joists; (2) galvanised steel wire, as per specification to be seen at the offices of the company, Nicholas-lane, London, E.C. Fees, which cannot under any circumstances be returned, are charged for the specifications as under, viz.:—For No. 1, 1*l*. 1s. each; and for No. 2, 10s. 6d.

AUGUST 15.—**Warrington.**—BOILERS.—Warrington Watch Committee invite tenders for boilers for heating the police buildings. All information can be obtained at the office of the Borough Surveyor, Town Hall.

AUGUST 26.—**Stanley.**—WIDENING BRIDGE.—Stanley U.D.C. invite tenders for the excavation and brickwork in connexion with the widening of the Houghal Burn Bridge, near West Shield Row Colliery, Stanley. Plans and specifications and form of tenders may be seen on application to the Surveyor, Council Offices, Stanley, on August 13, 15, and 19.

SEPTEMBER 2.—**Dublin.**—ENGINES, ETC.—Great Northern Railway Company (Ireland) Directors invite tenders for the supply of two six-wheeled coupled tank engines with trailing bogie, in accordance with the company's drawings and specification, copies of which can be obtained on application to Mr. T. Morrison, Secretary, Secretary's Office, Amiens-street Terminus, Dublin, on payment of 1*l*. 1s. (not returnable).

SEPTEMBER 2.—**Erith.**—ELECTRICAL AIR-COMPRESSOR.—The Erith U.D.C. invite tenders for the supply and erection of plant at thefr sewage disposal works, Manor-road, Erith. Copies of the specification, with form of tender, general conditions, and plan may be obtained from Mr. Charles H. Fry, Clerk of the Council, Council offices, Bexley-road, Erith, Kent. Plans and specifications may be seen, but not obtained at the offices of Messrs. Hawtayne & Zeden, Consulting Engineers to the Council, 9, Queen Street-place, London, E.C.

✱ SEPTEMBER 4.—**Tottenham.**—ENGINEERING PLANT.—The Metropolitan Asylums Board invite tenders for the supply and erection of general engineering plant, etc., complete at the North-Eastern Hospital, Tottenham. For further particulars refer to an advertisement in this issue.

SEPTEMBER 7.—**Clonmel.**—ELECTRIC LIGHTING.—Clonmel District Lunatic Asylum Joint Committee of Management invite tenders for lighting of the asylum. Plans may be inspected by appointment at the asylum, or at the office of the consulting engineer, Mr. Louis J. Lawless, A.Inst.E.E., 27, Castlewood-avenue, Rathmines, Dublin, from whom general conditions, form of tender, and specification may be obtained on payment of 3*l*. 3s.

NO DATE.—**London.**—BOILERS.—A range of six Lancashire boilers for an extensive cement works. Copies of the particulars and plan of the premises will be supplied on written application to Mr. R. Anderson, architect and C.E., 39, Victoria-street, Westminster, on deposit of 3*l*. 3s.

MISCELLANEOUS.

AUGUST 12.—**Manchester.**—NAME-PLATES.—The Paving, Sewering, and Highways Committee of the Manchester Corporation invite tenders for the repainting of about 13,000 street name-plates in the central district of the city. Particulars and forms of tender may be obtained on application to the District Surveyor, Paving, etc., Department, Town Hall, Manchester.

AUGUST 14.—**Stokesley.**—LIGHTING.—Stokesley P.C. invite tenders for the lighting of the streets with gas or oil. Forms of tender from Mr. Thos. Glasper, Clerk to Council, Stokesley.

AUGUST 15.—**Cork.**—FENCING.—Cork R.D.C. invite tenders for fencing twenty additional allotments to existing cottages, at per perch, not to exceed 12s. 6d. Ordnance sheets may be inspected, and specifications and tender forms for the works obtained, at the office of the Clerk to the R.D.C. A deposit of 10s. per plot is required with each tender.

SEPTEMBER 7.—**Camberley.**—STEAM ROLLER.—Frimley U.D.C. invite tenders for supplying or hiring of 12-ton steam rollers. Further particulars can be obtained from the Council's Surveyor, Mr. T. Clement Jones, C.E., Municipal Buildings, Camberley.

NO DATE.—**Chopwell.**—DRIVING STONE DRIFTS.—For driving two stone drifts, 250 yds. and 500 yds. long, together with ventilating staple, at Chopwell Colliery; electric current will be provided for rock drills. Further particulars can be had on application to Mr. F. O. Kirkup, Consett Iron Company, Ltd., Garesfield Colliery Offices, Newcastle-on-Tyne.

NO DATE.—**Richmond, Yorks.**—CLEANING OUT BECK.—For cleaning out Gilling Beck. Also Catchwater Drain. Particulars and letting apply Mr. R. Douthwaite, Gilling West, Richmond.

PAINTING, etc.

AUGUST 12.—**Liverpool.**—PAINTING.—Liverpool Select Vestry invite tenders for the painting (according to a specification which may be seen at office of Mr. H. J. Hagger, Vestry Clerk, Parish Office, Liverpool) of the inferior of the acute and lying-in blocks of the Workhouse, Brownlow-hill.

AUGUST 12.—**Wakefield.**—TARRING, ETC.—For tarring and painting the outside of the Wakefield Hippodrome (corrugated iron). Further particulars apply Mr. Walter Emmett, Southgate, Wakefield.

AUGUST 13.—**Nottingham.**—PAINTING.—Nottingham Education Committee invite tenders for inside and outside painting at All Saints' Council School, Forest-road. Specifications, bills of quantities, and forms of tender may be obtained from Mr. Frank B. Lewis, City Architect, Guildhall, on payment of a deposit of 1*l*.

AUGUST 14.—**Epsom.**—PAINTING.—Epsom (Rural), Sutton, Carshalton, and Leatherhead Joint Hospital Board Visiting Committee of the Cuddington Hospital invite tenders for the painting of the outside of the hospital, situate near Banstead Railway Station. Copies of the specification and forms of tender can be obtained on application to Mr. W. O. Reader, Clerk, "Lonsdale," Epsom.

AUGUST 14.—**Forden.**—PAINTING, ETC.—The painting of, and small repairs to, the Isolation Hospital at Forden. For full particulars apply to Mr. Charles S. Pryce, Clerk to the Committee, Montgomery.

AUGUST 15.—**Banbury.**—PAINTING, ETC.—Banbury T.C. invite tenders for painting and decorating the Police-court and other portions of the Municipal Buildings. Specification can be seen, and other information obtained, on application at the Borough Accountant's Office.

✱ AUGUST 22.—**Kensington.**—PAINTING, ETC.—The Guardians of Kensington invite tenders for painting and decorating their Board-room, Marloes-road, Kensington. For further particulars refer to an advertisement in this issue.

NO DATE.—**Bradford.**—PAINTING.—Bradford Guardians invite tenders for cleaning and painting required to be done to the interior of hospital buildings at the Union Hospital, Horton-lane, Bradford. Names (along with 1*l*. 1s. deposit) to Mr. Fred Holland, Engineer and Architect to the Board, 11, Parkinson's-chambers, Hustlergate, Bradford.

NO DATE.—**South Farnborough.**—PAINTING.—The external painting of all wood and iron work of South Farnborough Working Men's Club. Particulars can be obtained by applying to Mr. J. H. Paice, Secretary.

ROADS, SANITARY, AND WATER WORKS.

AUGUST 12.—**Whitwell.**—SEWERS.—Clown R.D.C. invite tenders for the construction of new sewers, together with manholes. Conditions, specification, quantities, and form of tender may be obtained from the Council's Surveyor, Mr. J. T. Pears, Hollin-hill, Clown, on payment of the sum of 1*l*. 1s.

AUGUST 13.—**Chipping Sodbury.**—GASWORKS.—The Directors of the Chipping Sodbury Gas and Coke Company, Ltd., invite tenders:—(*a*) For excavation and foundation for a new gas holder at the Company's works at Yate; (*b*) for laying pipes (to be provided by the Company) from the gasworks to the entrance of Yate Railway Station, in accordance with specifications prepared by Mr. N. H. Humphrys, Gas Engineer, Salisbury, copies of which may be seen at the Gasworks.

AUGUST 14.—**Helensburgh.**—ESPLANADE EXTENSION.—Helensburgh T.C. invite tenders for an extension of the esplanade and improvement of Row-road. Drawings may be seen at the office of the engineers, Messrs. Babtie, Shaw, & Morton, C.E., 224, St. Vincent-street, Glasgow, or Mr. J. R. Wilson, Burgh Surveyor, Helensburgh, from whom copies of the specification and schedule may be obtained on payment of 1*l*. 1s.

AUGUST 14.—**Rochdale.**—SEWER.—The Rochdale Paving, etc., Committee invite tenders for the construction of about 330 lin. yds. of 1 ft. 8 in. by 2 ft. 6 in. brick sewer in Thrum Hall-lane, and through private land to Lower Healey-lane. Plans, etc., may be seen, and copies of the specification, quantities, and form of tender may be obtained on payment of a deposit of 2*l*. 2s., at the office of Mr. S. S. Platt, Borough Surveyor, Town Hall, Rochdale.

AUGUST 14.—**Ryton.**—FOOTWAYS.—The Ryton U.D.C. invite tenders for laying about 1,800 sq. yds. of tarred or asphalted footways between Runhead and Hedgefield. Particulars may be obtained on application to Mr. John P. Dalton, Surveyor, Council Offices, Ryton-on-Tyne.

AUGUST 16.—**Bedford.**—SHARNBROOK DRAINAGE.—Bedford R.D.C. invite tenders for the laying of half a mile of 6-in. sewer with manholes, etc., and for the construction of the necessary outfall works. Drawings and specifications for the work may be seen, and forms of tender obtained, at the office of the District Council, No. 1, Harpur-street, Bedford, or that of Mr. Arthur J. Martin, M.Inst.C.E., 7, Victoria-street, Westminster, on payment of a deposit of 1*l*. 1s.

AUGUST 17.—**Chesham.**—STREET WORKS.—Chesham U.D.C. invites tenders for the carrying out of certain private street works, including metalling, gravelling, kerbing, channelling, and fencing, in Severalls-avenue, situate within the Urban District of Chesham. Plans, sections, and specification may be seen upon application to Mr. Percy C. Dormer, Engineer and Surveyor, Council Offices, Chesham.

AUGUST 17.—**Perth.**—ROAD WORKS.—Perth T.C. invite tenders for causewaying in Abbot-street, Craigie, Perth. Plans can be seen, and specifications and schedule of quantities obtained, at the office of Mr. Robert M'Killop, Burgh Surveyor, 16, Tay-street, Perth.

✱ AUGUST 26.—**Coventry.**—PIPE-LAYING.—The Corporation of Coventry invite tenders for laying about eight miles of 20-in., and four miles of 16-in., internal diameter, cast-iron socket pipes. For further particulars refer to an advertisement in this issue.

AUGUST 26.—**Uxbridge.**—EXTENSION OF SEWERS.—Uxbridge U.D.C. invite tenders for the construction of new sewers and other appurtenant works in Harefield-road and High-street, Uxbridge, Middlesex. Plans and specifications may be seen at the offices of the Council's Surveyor, Mr. William L. Eves, 54, High-street, Uxbridge, and bills of quantities and forms of tender obtained on application to Mr. W. T. Harvey, Clerk to the Council, Council Offices, 126, High-street, Uxbridge, upon deposit of 2*l*. 2s.

AUGUST 27.—**Exmouth.**—RESERVOIR, ETC.—Exmouth U.D.C. invite tenders for high-level reservoir, filter-beds, pipe line, etc (three contracts). Drawings can be seen, and conditions, specifications, and quantities obtained, at the offices of Mr. Samuel Hutton, Surveyor and Water Engineer, Council Offices, Exmouth, on payment of a deposit of 1*l*. 1s. (by cheque) for each contract.

AUGUST 28.—**Carshalton.**—ROAD WORKS.—Carshalton U.D.C. invite tenders for the making-up of Blakehall-road. Bill's of quantities and all particulars can be obtained on application at office of Mr. C. P. Lovelock, Clerk, District Council Office, High-street, Carshalton, and on deposit of 1*l*.

AUGUST 30.—**Eaglescliffe.**—SCHOOL DRAINAGE, ETC.—Durham C.C. Education Department invite tenders for laying the footpath and providing a drain in connexion with Eaglescliffe Junction Council School. Plan and specification can be seen at the office of the architect, Mr. J. Sanderson, 134, High-street, Stockton-on-Tees.

NO DATE.—**Naas.**—DRAIN, ETC.—An outfall drain, septic tank, and bacterial filters at the Kennels, Jigginstown, near Naas, for the Kildare Hunt Club. Plans and specification may be seen, and all particulars obtained, at office of Mr. Francis Bergin, B.E., 36, Westmoreland-street, Dublin, or at the Kennels.

STONE, MATERIALS, AND STORES.

AUGUST 14.—**Dublin.**—MATERIALS.—Great Southern and Western Railway Company (Ireland) Directors invite tenders for the supply of the following material:—3,000 tons steel bull-head rails, 500 tons steel sole-plates, 300 tons steel fish-plates, 1,800 tons cast-iron chairs, in accordance with specifications, which can be obtained on application to the Engineer of the Company, Inchicore, Dublin. The specifications for the rails, sole-plates, fish-plates, and chairs are upon separate forms, and a charge of 5s., which is not returnable, will be made for each specification.

AUGUST 14.—**London.**—MATERIALS.—The Bengal and North-Western Railway Company Directors invite tenders for the supply and delivery of 6 tons galvanised eye bolts and 50 tons strand wire for fencing, as per specification to be seen at the Company's Offices, 237, Gresham House, Old Broad-street, London, E.C.

AUGUST 17.—**Helensburgh.**—ROAD METAL.—Helensburgh T.C. invite offers for 2,000 tons (2½ in.), also 200 tons (1½ in.) best blue whin road metal, and 200 tons whin blinding material. Specification and form of tender can be obtained from Mr. J. R. Wilson, Burgh Surveyor.

AUGUST 20.—**Nantyglo.**—ROAD MATERIAL.—Nantyglo and Blaina U.D.C. invite tenders for the supply of limestone, granite, limestone chippings, and granite chippings. Samples to be sent to Mr. W. J. Davies, Blaina, the Council's Surveyor.

SEPTEMBER 2.—**Loughton.**—ROAD MATERIAL.—Loughton U.D.C. invite tenders for the supply of granite, gravel, and destructor clinker. The District Surveyor to the Council will supply all information required.

SEPTEMBER 3.—**Leatherhead.**—MATERIALS.—Leatherhead U.D.C. invite tenders for the supply of materials and labour for the year ending September 30, 1908. Specification and form of tender can be obtained at the office of Mr. J. E. Smales, Surveyor, Council Offices Leatherhead.

SEPTEMBER 4.—**Guildford.**—GRANITE.—Guildford T.C. invite tenders for the supply and delivery of road materials. Forms of tender and conditions of contract may be obtained on application to Mr. C. G. Mason, A.M.Inst.C.E., the Borough Engineer and Surveyor, at his office, Tun's Gate, Guildford.

SEPTEMBER 7.—**Camberley.**—FLINTS.—Frimley U.D.C. invite tenders for the supply of 2,158 cubic yds. of large flints. Particulars and form of tender may be obtained on application to Mr. T. Clement Jones, C.E., Engineer and Surveyor to the Council, Municipal Buildings, Camberley, on payment of 2*l*. 2s.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*MASTER AND LECTURER (DEPART. OF ARCHITECTURE)	Sheffield University	200*l*. per annum	Aug. 17
*CLERK OF WORKS	Carlisle Education Com.	3*l*. 3s. per week	Aug. 19
*ASSISTANT ARCHITECT	Durham County Council	250*l*. per annum	Aug. 24
*DRAUGHTSMAN	Durham County Council	100*l*. per annum	do.
*QUANTITY SURVEYOR	Durham County Council	200*l*. per annum	do.
*ASSISTANT TO QUANTITY SURVEYOR	Durham County Council	100*l*. per annum	do.
*ENGINEER AND CLERK OF WORKS	Kent County Lunatic Asylum	110*l*., etc., per annum	Aug. 31

Auction Sale.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	Aug. 14

LEGAL.—*Continued from page 177.*

defendants in 1904, and to get a decision on the matter the plaintiffs, hay and straw salesmen, caused three laden vans to be placed in Leman-street, which runs off High-street, Whitechapel, and the officers of the Borough Council had them removed into George-street. Thereupon action was brought by the plaintiffs, and the case came before Mr. Justice Swinfen Eady about twelve months ago. In giving judgment his Lordship said it was conceded that there was an ancient market. The Act of 1770 contained a recital that there was due, and had been accustomed to be received, for every cart or wagon laden with hay or straw on the usual market days, a sum of sixpence, of which twopence went to the lord of the manor of Stepney. The plaintiffs submitted that the market extended beyond High-street, and could be lawfully held in adjoining streets, of which Commercial-street was constructed and Leman-street widened under statutory powers subsequent to 1840, and Commercial-road had been made since 1865. Judging from the evidence and the documents, his Lordship was of opinion that the market was one which might be extended as exigencies required to streets adjoining High-street, which were presumed to have been dedicated to the public subject to the exercise of the market franchise. He therefore held that the plaintiffs had a perfect right to place their vans in Leman-street, and that the market regulations made in 1904 were invalid. Plaintiffs did not claim any money payment in respect of damages, and his Lordship merely made a declaration in accordance with the statement of claim, and ordered the defendants to pay the costs.

The appeal was argued by Mr. M. MacMorran, K.C., and Mr. Courthope Munroe for the appellants; and Mr. Horace Avory, K.C., Mr. W. Frampton, and Mr. Woodgate for the respondents.

Lord Justice Vaughan Williams held that the appeal should be dismissed, subject to a slight variation of the declaration contained in the judge's order.

Lord Justice Moulton dissented. He could find no evidence of user for the purposes of a market in any street other than High-street prior to an Act of 1853, which empowered the trustees to use other streets when they considered that High-street was overcrowded. There were no market rights in the side streets.

Lord Justice Buckley agreed with Lord Justice Vaughan Williams that there was a market franchise in the side streets, but pointed out that salesmen had no right to say where they would stand.

The Court, therefore, by a majority dismissed the appeal.

DISPUTED COMMISSION ON INDIAN CONTRACT.

THE case of Kindermann *v.* Waring & Gillow came before the Court of Appeal, consisting of Lords Justices Vaughan-Williams and Moulton, on the 25th ult., on the plaintiff's appeal from an order of Mr. Justice Jelf in Chambers directing a commission to issue to the High Court in India to take the evidence of a gentleman named Boden.

Mr. McCall, K.C., in support of the appeal, said that the plaintiff, who carried on business in London in 1903, became acquainted with Mr. Boden, who at that time was in England for the purpose of placing an order for the building of a palace for a certain Maharajah of one of the native States in the Punjaub. When the plaintiff became aware of Mr. Boden's mission and found that he had this large order to place he invited him to place it with the defendants. Mr. Boden at that time was minded to place it with Messrs. Maple, but upon the invitation of the plaintiff he agreed to consider the placing of the order with the defendants. Thereupon plaintiff wrote to the defendants on June 28, 1903, stating that he would expect to get 10 per cent. commission if the order were placed with the defendants. The plaintiff accordingly introduced Mr. Boden to the defendants, and a considerable amount of correspondence took place. Subsequently the plaintiff asked to have the commission contract put on paper, and on June 4, 1904, the defendants agreed to pay the plaintiff 5 per cent. on any order for decoration or furnishing placed with them, and upon that basis the business went through and work to the amount of upwards of 36,000*l.* was done. After the work was completed the plaintiff applied for his commission, and after considerable correspondence with the defendants he brought the present action for his commission. The pleaded defence was a denial of the introduction and non-admittance of the alleged contract. The statement of defence was delivered on January 30 last, and the action was set down for trial. In May the defendants applied for and obtained an order to amend the defence, and then defendants set up for the first time that the contract upon which the plaintiff relied had been obtained by false and fraudulent representation. But for the defence being amended the case would have been tried before the present time. Upon the amended defence the defendants applied for and obtained from the Master letters of request directed to the proper tribunal for the examination of Mr. Boden, and Mr. Justice Jelf dismissed the plaintiff's appeal from that order.

Lord Justice Moulton pointed out that as the case could not possibly be tried until after the Long Vacation, he could not see why the plaintiff should object to the commission going.

Mr. McCall said that if proper terms were imposed on the defendants he would not object to the commission.

Counsel on behalf of the defendants asked that the trial of the case should be postponed until November 1, as it would take about ten weeks to get the evidence from India.

This request was acceded to, and it was also arranged that the costs of the commission should be reserved to the judge who tried the case, and that if the commission failed to obtain the evidence of Mr. Boden the Court should have power to give the plaintiff the costs of it as between solicitor and client. The costs of the present appeal were made costs in the cause.

Patents of the Week.

APPLICATIONS PUBLISHED.*

15,625 of 1906.—E. R. CAHOONE: *Fireplaces of Ranges and other Stoves.*

This relates to a stove having air heating chambers adapted to preliminarily heat and deliver the air with a plurality of ducts or minor chambers in the walls of the air heating chamber, from which ducts the heated air passes to aid in the combustion of the fuel, and comprises the arrangement of a lining adapted to be mounted in the front and sides of the stove, and composed of an outer and inner section forming respectively an air intake chamber and an outlet into the fire-pot, said inner section being provided with a number of vertical ridges forming a series of air passages.

15,908 of 1906.—CHAMBERLIN METAL WEATHER STRIP COMPANY: *Weather Excluders for Doors, Windows, and the like.*

This relates to a weather excluder for doors, windows, and the like, comprising two metallic members, one of said members being provided with a securing flange for fastening the same to a window-frame or door, and an outwardly extending hollow rib of sheet metal bent upon itself, and adapted to enter the other of said members, which is also formed of sheet metal bent upon itself to form a groove, and is so mounted in a groove in a window, sash, or door-frame that it can shift bodily in a lateral direction.

16,164 of 1906.—B. NEUBURGER: *Manufacture of Sorel Cement.*

This relates to a process for the manufacture of sorel cement free from sodium salts from magnesia and a solution of chloride of magnesium obtained by the action of hydrochloric acid on magnesite, and is characterised by the carbonic acid generated by the action of hydrochloric acid on magnesite which is free from sodium salts, being passed through a solution of chloride of magnesium until it is completely saturated, whereupon the said solution is mixed in a known manner with magnesia.

16,173 of 1906.—A. MOLE: *Hanging of Window Sashes and the like.*

This relates to windows having sashes balanced one against the other, and comprises the combination of an arrangement whereby one sash is caused to move on opening or closing at twice the speed of the other sash with a device such as a deep sill weather board or the like such that one sash can be opened to a considerable extent whilst the other remains closed.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

16,268 of 1906.—J. F. PIXLEY: *Registering Locking Bolts for Doors and the like.*

This consists in the combination with a casing and a keeper of a locking bolt rotatively journaled and operating in said casing and adapted to be projected into or withdrawn from said keeper, an arm or finger arranged to project into the path of said bolt to be rocked when said bolt is moved endwise, said arm or finger being independent of said bolt to permit the rotative movement of the latter, and a registering mechanism arranged in a chambered extension of the casing and operated by said arm or finger.

19,381 of 1906.—A. BODE: *Travelling Cranes.*

This relates to a crane-carrying structure in which a longitudinal girder is provided, and in which one of the tracks for two travelling cranes is laid on each side of the longitudinal girder, whilst a track is arranged for a third crane below the longitudinal girder.

20,987 of 1906.—W. HENMAN: *Metal Reinforced Plaster or Concrete Structures.*

This relates to metal reinforced concrete plaster or like structures, and consists in providing main reinforcing members formed from a slitted strip expanded to a curved form and arranged girder-wise in the combined structure.

23,920 of 1906.—H. S. LESTER: *Glazing Bars or Astragals for Roof Lights and Windows.*

This relates to a device for holding a glazing bar or astragal comprising a carrying part of known form, a web projecting at right angles from this part and an inflated channel section of such a depth that it extends over the vertical web of the astragal and holds both the astragal and the glass down, with or without a sole of known form beneath the astragal, and with means for securing the device in position such that it is not necessary to pierce or cut the astragal or its sheath.

25,596 of 1906.—F. E. WATSON: *Latch for Gates, Slides, and the like.*

This relates to a gate latch comprising a pivoted latch plate provided with a groove or slot to receive the gate latch pin and a series of teeth adapted to contact with projections on a latch lever, and means whereby the latch plate may be operated from either side of the gate post by depressing a thumb lever when the gate is in its closed position, the catch or latch being thus actuated and releasing the latch pin and throwing the gate partly open.

506 of 1907.—W. F. CALLEAR: *Blades of Stone-cutting Saws.*

This relates to the blades of stone-cutting saws, and consists in forming transverse angular projections or ribs having angular edges and narrow in proportion to the spaces between them alternately on both surfaces of the blade during the process of rolling.

2,682 of 1907.—W. C. CHAPPELL: *Joiner's Sash Cramp.*

This relates to a joiner's sash cramp having a wide flanged, rolled, or cast-steel bar of L or T section with a rack formed across the top surface upon which bar slide two metal "shoes" with extended bearings and a raised "bed," one shoe having a solid detent cast in its slot to engage in the rack of the bar and the other shoe being propelled and withdrawn by an operating screw.

7,205 of 1907.—MAY & PADMORE, LTD., and W. F. N. MAY: *Fanlight and Analogous Catches.*

This relates to fanlights and analogous catches, and consists in pivoting the bolt-withdrawing arm or lever upon a cross-pin directed transversely across the hollow body of the catch casing and with the bolt guided or positioned by a covered plate located in the latch casing.

10,529 of 1907.—A. NOPPEL: *Block for use in the Construction of Stable Flooring.*

This relates to a block with intersecting grooves for making stable floorings, the distinguishing feature being that the grooves arranged in the longitudinal direction are of slightly undulated cross section, and are interrupted by smooth transversely running channels formed deeper for the purpose of avoiding any lodging of bodies or accumulation of liquid manure from the channels in the longitudinal grooves.

1,112 of 1907.—J. SHANKS: *Waste-preventing Discharge Valves for Water-closet and like Cisterns.*

This relates to water-closet and like cisterns,

and comprises a waste-preventing discharge valve in which a sucker actuated by the usual pull lever is combined with a float valve.

28,199A of 1906.—ISOLATOREN-FABRIK "PULVOLIT" GES. M.B. H.: *Manufacture of Artificial Stone or the like.*

This relates to a process for manufacturing artificial stone and the like, and is characterised by the addition to the binding substances of such resins, resinous artificial or waste products, resinous driers and the like, or solutions of the same, which exercise catalytic action by absorbing oxygen from the air and transmitting it to the binding medium and thus accelerating the solidifying process of the moist loose powder, the catalytic action of the additions being assisted by the pulverised mixture.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

July 23.—By HOLLOWAY, PRICE, & Co. (at Market Harborough).

Blaston, Leicester.—An enclosure of freehold land, 33 a. 3 r. 32 p. £1,500

July 24.—By KEMSLEYS (at Romford).

Romford, Essex.—1 to 8, Oldchurch-rd., f., y.r. 166*l.* 8s. 1,600

July 25.—By C. C. & T. MOORE.

Mile End.—108, Turners-rd., u.t. 62½ yrs., g.r. 5*l.*, e.r. 59*l.* 315

128, Turners-rd. (s.), u.t. 54 yrs., g.r. 5*l.*, w.r. 38*l.* 7s. 300

149 Turners-rd., u.t. 67 yrs., g.r. 5*l.*, w.r. 40*l.* 6s. 245

32, 34, and 36, St. Dunstan's-rd., u.t. 44 yrs., g.r. 11*l.* 13s. 6d., w.r. 78*l.* 340

By NEWBON, SHEPHARD, & EDWARDS.

Islington.—39, Barnsbury-st., u.t. 16½ yrs., g.r. nil, e.r. 50*l.* 190

Caledonian-road.—36, Freeling-st., u.t. 37 yrs., g.r. 6*l.*, w.r. 44*l.* 4s. 130

Kentish Town.—83, Allcroft-rd., u.t. 58½ yrs., g.r. 7*l.*, w.r. 52*l.* 300

Holloway.—100, Hornsey-rd. (s.), u.t. 35½ yrs., g.r. 6*l.*, y.r. 52*l.* 300

Highbury.—2, 4, 6, and 8, Corsica-st., u.t. 59 yrs., g.r. 18*l.*, w.r. 110*l.* 4s. 600

Canonbury.—27, Wallace-rd., u.t. 18¾ yrs., g.r. 7*l.* 7s., y.r. 40*l.* 135

By STIMSON & SONS.

City.—Montague-ct., f.g.r. 20*l.*, reversion in 70 yrs. 340

Dulwich.—3 and 4, College-gdns., u.t. 42 yrs., g.r. 25*l.* 8s. 4d., y. and e.r. 150*l.* 1,100

Camberwell.—47 and 49, Peckham-gr., f., w.r. and e.r. 98*l.* 760

Clapton.—54 and 56, Clifden-rd., u.t. 58 yrs., g.r. 10*l.*, w.r. 78*l.* 325

Camberwell.—83, Avenue-rd. (s.), u.t. 44 yrs. g.r. 5*l.*, w.r. 48*l.* 12s. 200

Clapham.—2 and 3, Carfax-sq., u.t. 67 yrs., g.r. 11*l.*, w.r. 70*l.* 4s. 325

Fulham.—1, Reporton-rd., u.t. 71 yrs., g.r. 6*l.*, w.r. 46*l.* 6s. 310

Twickenham.—Garfield-rd., f.g.r. 95*l.*, reversion in 74 yrs. 2,000

Regent's Park.—Redhill-st., i.g.r. 33*l.* 19s., u.t. 18 yrs., g.r. 10*l.* 2s. 225

Clapham.—59 and 61, Larkhall-la., u.t. 30 yrs., g.r. 12*l.*, w.r. 83*l.* 4s. 400

By W. J. STOCKBRIDGE & Co.

Woodford.—2, Ingatestone-rd., u.t. 91 yrs., g.r. 4*l.*, e.r. 32*l.* 300

By JOSEPH STOWER.

Gillingham, Kent.—34, High-st. (s.), f., y.r. 40*l.* 700

By DRIVER, JONAS, & Co. (at Hinckley).

Hinckley, Burbage, etc., Leicestershire.—Part of the outlying portions of Lord Lucas's estate, farms, and enclosures of land, 194 acres, f. (in lots) 8,420

By NICHOLAS, DENYER, & Co. (at Reading).

Reading.—14 to 30 (even), Cholmeley-rd. (s.) and cottages, f., w.r. 209*l.* 8s. 2,200

158, Wantage-rd., f., y.r. 24*l.* 365

By MADDISON, MILES, & MADDISON (at Bungay).

Bungay, Suffolk.—Earsham-st., house and shop, f. 305

By ALFRED SPAIN & Co. (at Gravesend).

Gravesend.—Leith-pk., Glen View House, f., y.r. 72*l.* 2s. 1,050

Northfleet.—9, The Hill (s.), f., y.r. 28*l.* 340

July 26.—By HATCH & HATCH.

Lewisham.—4, Arthurdon-st., u.t. 84 yrs., g.r. 5*l.* 10s., e.r. 30*l.* 200

Beckenham.—Villier's-rd., Five Houses, f., w. and e.r. 120*l.* 1,250

By HENRY HOLMES & Co.

Marylebone.—8, Little Titchfield-st., u.t. 41½ yrs., g.r. 18*l.*, w.r. 156*l.* 800

By MARK LIELL & SON.

Leytonstone.—26, Cowley-rd., f., e.r. 40*l.* 425

Forest Gate.—38, 40, 42, and 44, Whyteville-rd., u.t. 81 yrs., g.r. 21*l.*, w.r. 114*l.* 8s. 465

By NOKES & NOKES.

Caledonian-road.—141, Coledonian-rd. (s.), u.t. 32¾ yrs., g.r. 25*l.*, y.r. 65*l.* 200

Hampstead.—Sumatra-rd., f.g.r. 10*l.*, reversion in 83 yrs. 205

By TOPLIS & HARDING.

Golden-Square, W.—2, Marshall-st. (s.), f., y.r. 60*l.* 1,550

By HANNAFORD & SON (at Barnstaple).

Bishopsnympton, etc., Devon.—Farms and accommodation lands, 1,412 a. 1 r. 29 p., f. (in lots) 20,476

Lapford, Devon.—Filleigh Barton Estate, 170 acres, f. 2,275

By G. B. HILLIARD (at Chelmsford).

Rettendon, Essex.—Buckhatch and Brook Hall, 105 acres, f. 1,270

By DYER, SON, & HILTON (at Lewisham).

Lewisham.—109 and 111, Gilmore-rd., u.t. 59 yrs., g.r. 9*l.*, y. and e.r. 60*l.* £345

By HARRY BALL (at Bedford).

Bedford.—Newnham-st., freehold plot of land.. 620

40, Denmark-st., 88, Iddesleigh-rd., and 55, George-st., f., p. 720

July 27.—By BIDWELL & SONS (at Wisbech).

Coldham, Cambridge.—Part of the Coldham House Estate, 153 a. 3 r. 8 p., f. (in nine lots) 10,205

By MADDISON, MILES, & MADDISON (at Norwich).

North Walsham, Norfolk.—Mucklehill Farm, 80 a. 2 r. 6 p., f. 2,000

South Walsham, Norfolk.—New-rd., freehold grazing land, 14½ acres 540

By DRIVER, JONAS, & Co. (at Bedford).

Blunham, Beds.—Part of the outlying portions of Lord Lucas's estates, farms, accommodation holdings, etc., 109 acres, f. (in lots).... 6,600

July 29.—By DAVID BURNETT & Co.

City.—49, Moorgate-st. (s.), u.t. 9 yrs., g.r. 50*l.*, y.r. 425*l.* 2,000

Norwood.—159 to 165 (odd), Portland-st., u.t. 68½ yrs., g.r. 20*l.*, e.r. 140*l.* 480

Kingsland.—76, Kingsland-rd. (s.), f., y.r. 37*l.* 10s. 890

By BOX, MACHIN, & GAPP.

St. John's Wood.—Henry-st., i.g.r. 109*l.*, u.t. 11 yrs., g.r. 13*l.* 225

By ELLIOTT, SON, & BOYTON.

Marylebone-road.—35, Wyndham-st., f., w.r. 143*l.* 1,270

King's Cross.—6, Frederick-st., f., y.r. 50*l.* 630

By JONES, LANG, & Co.

Belgravia.—5, Eaton-sq., u.t. 5 yrs., g.r. 34*l.*, y.r. 260*l.* 615

City.—59, Fleet-st. and 2, Pleydell-st., building site, lease for 90 yrs., 1,075 ft., let at per annum 405

Old Bailey, building site, lease for 90 yrs., 12,771 ft., let at per annum 1,450

By FRANK JOLLY & JAMES.

Hackney.—134, Amhurst-rd., u.t. 59 yrs., g.r. 8*l.* 8s., e.r. 55*l.* 450

By T. WOODS.

Hounslow.—Staines-rd., "The Lord Palmerston" p.h., f., y.r. 105*l* 4,500

Twickenham.—1 and 2, Church-st. (s.), f., p. .. 940

By R. & J. R. MITCHELL (at Cockermouth).

Cockermouth, etc., Cumberland.—Grecian Villa and enclosures of land, 819 acres, f. (in lots) 11,530

By LEONARD T. DAVEY (at Mitcham).

Mitcham.—London-rd., The Elmwood Estate, 11 plots of building land, f. 1,209

By CECIL HOBDAY (at Putney).

Barnes.—37, Merthyr-ter., u.t. 61 yrs., g.r. 6*l.*, w.r. 33*l.* 16s. 225

East Putney.—28, Oakhill-rd., u.t. 78 yrs., g.r. 9*l.* 9s., p. 510

July 30.—By C. W. DAVIES & SON.

Barnsbury.—Cloudesley-rd., f.g.r. 12*l.*, reversion in 16 yrs. 405

By DEBENHAM, TEWSON, RICHARDSON, & Co.

Sydenham.—135A, 135B, and 135C, Sydenham-rd., and house in rear with land, area 25,100 ft., f. 1,100

Regent's Park.—90 and 92, Osnaburgh-st. (s.), u.t. 16 yrs., g.r. 20*l.*, y.r. 63*l.* 165

Camberwell.—45 to 63 (odd), Warner-rd., f., e.r. 322*l.* 3,850

69 and 71, Warner-rd., f., e.r. 60*l.* 690

1, 3, and 5, Crawford-st., and laundry premises, f., e.r. 110*l.* 1,150

Valmar-rd., freehold building land, 1 r. 7 p... 900

By DREW & SON.

Sutton.—2, High-st. (s.), u.t. 56 yrs., g.r. 25*l.*, y.r. 135*l.* 2,110

Weybridge.—2 and 3, Montgomery-villas, f., y.r. 55*l.* 970

By EDWIN EVANS.

Fulham.—3 to 27 (odd), Querrin-st., u.t. 88½ yrs., g.r. 7*l.* 10s., w.r. 55*l.* 14s. 2,625

Harlesden.—"Hillside," f.g.r. 24*l.*, reversion in 60 yrs. 570

By EDWARD J. GAIRDNER.

Edgware-road.—Edgware-rd., etc., i.g. rents, 199*l.*, u.t. 18¼ yrs., g.r. 25*l.* 2,225

By ALFRED PREECE & SON.

Battersea.—Kambala-rd., f.g. rents 27*l.* 10s., revision in 73 yrs. 705

Camberwell.—16, Maude-rd. and 25, Dagmar-rd., u.t. 57 yrs., g.r. 6*l.* 660

By ROGERS, CHAPMAN, & THOMAS.

Hammersmith.—Goldhawk-rd.. "The Queen of England" p.h., etc., f.g.r. 13*l.* 10s., reversion in 28 yrs. 1,450

Streatham.—Thrale-rd., f.g.r. 18*l.*, reversion in 96 yrs. 460

Hindhead.—High Pitfold-la., St. Andrew's Lodge, f., y.r. 25*l.* 450

Hammersmith.—Ravenscourt-sq., etc., and f.g. rents 66*l.* 17s. 6d., reversion in 44 yrs. 2,520

Ravenscourt-pk., etc., c.g. rents 190*l.* 10s., with reversions 9,725

By J. T. SKELDING.

Ilford.—Brisbane-rd., Glenomara, f., p. 650

By WALLACE & Co.

Wood Green.—9, 11, 13, and 15, Dunbar-rd., f., e.r. 104*l.* 1,000

By WARE & Co.

Paddington.—I.g. rents 69*l.*, u.t. 71 yrs., g r. 2*l.* 1,160

By FREDERICK WARMAN.

Bowes Park.—88, Sylvan-av., u.t. 99 yrs., g.r. 7*l.* 7s., y.r. 39*l.* 370

By W. H. HANSON & WHEELDON (at Gainsborough).

Gate Burton, etc., Lincoln.—Gate Burton and Naith Estates, 3,140 acres, f. (in 18 lots) .. 58,431

By H. J. CHEFFINS (at Saffron Waldon).

Great Chishall, Essex.—Bridgefoot Farm, 111 acres, f. 2,100

By G. B. HILLARD & SON (at Billericay).

Billericay, Essex.—Three freehold cottages, w.r. 19*l.* 10s. £180

Margaretting Tye, Essex.—Cottage and gardens, ½ acre, c., w.r. 18*l.* 4s. 120

By SMALLPIECE, ALLEN, & Co. (at Brookwood).

Brookwood, Surrey.—1 and 2, Connaught-villas, f., w.r. 45*l.* 10s. 420

July 31.—By BAXTER, PAYNE, & LEPPER.

Beckenham, Kent.—26, The Avenue, u.t. 54 yrs., g.r. 7*l.*, p. 600

By H. DONALDSON & SONS.

Dalston.—72A, Brownlow-rd. (workshops), u.t. 29½ yrs., g.r. nil, w r. 83*l.* 4s. 350

7, St. Philips-rd., u.t. 43 yrs., g.r 5*l.* 10s., e.r. 38*l.* 325

By DYER, SON, & HILTON.

Plumstead.—Plum-la., f.g.r. 95*l.* 5s., reversion in 59 yrs 2,100

Barth-rd., f.g.r. 15*l.*, reversion in 59½ yrs.... 315

Welling, Kent.—1, Danson-villas, f., y.r. 32*l.* 10s. 350

Dartford.—Bayly-rd., f g.r. 21*l.* 16s., reversion in 84 yrs 410

By W. B. HALLETT.

Manor Park.—58 to 68 (even), First-av., f., e.r. 195*l.* 1,590

Kentish Town.—58, Malden-rd. (s.), u.t. 33½ yrs., g.r. 10*l.*, y.r. 75*l.* 610

By REYNOLDS & EASON.

Bethnal Green.—Fuller-st., f.g.r. 35*l.*, reversion in 66½ yrs. 710

By E. & S. SMITH.

Tooting.—37, 39, 41, 43, 45, 47, and 49, Mitcham-rd., f., y.r. 143*l.* 2,550

Muswell-hill.—Rosemount, f., y.r. 60*l.* 1,100

Clerkenwell.—21, Great Percy-st., u.t. 11 yrs., g.r. 6*l.*, e.r. 60*l.* 210

By ROBERT TIDEY & SON.

Dalston.—Navarino-rd., i.g.r. 35*l.*, u.t. 46 yrs., g.r. 16*l.* 8s. 200

Homerton.—Mehetabel-rd., i.g.r. 40*l.*, u.t. 45 yrs., g.r. 30*l.* 100

Hackney.—Well-st., i.g.r. 19*l.* 10s., u.t. 38 yrs., g.r. 6*l.* 130

Chelsea.—Hasker-st., i.g.r. 21*l.*, u.t. 36 yrs., g.r. nil 305

Lewisham.—Ladywell-pk., i.g r. 15*l.* 10s., u.t. 32 yrs., g.r. nil 195

Islington.—Balls Pond-rd., i.g.r. 26*l.* u.t. 13*l.*, g.r. 5*l.* 100

Wapping.—49, Great Hermitage-st., f., p. 200

Islington.—St. Alban's-pl., stabling, f., area 2,500 ft., p. 575

By WINTERTON & SONS (at Uttoxeter).

Leigh, Staffordshire.—The Nether Farm, 51 a. 1 r. 36 p., f. 1,570

August 1.—By SIDNEY BOWYER & Co.

Hampstead.—5, Downside-cres., u.t. 89 yrs., g.r. 10*l.* 10s., p. 1,000

By MELLERSH & HARDING.

Hatton, Warwick.—Nunhold Grange, 2½ acres, f. 2,500

By MORETON RICHES.

Wandsworth.—34 and 36, Park-rd., f., y.r. 90*l.* 1,205

5, Huguenot-pl., u.t. 79 yrs., g.r. 10*l.*, y.r. 50*l.* 530

By NEWBON, SHEPHARD, & EDWARDS.

Holloway.—Harvist-rd., i.g.r. 56*l.*, u.t. 35½ yrs., g.r. 20*l.* 510

Isledon-rd., i.g.r. 26*l.*, u.t. 35½ yrs., g.r. 10*l.*.. 225

Islington.—Linton-st., i.g.r. 46*l.* 4s., u.t. 20 yrs., g.r. 21*l.* 13s. 4d. 200

Stoke Newington.—29, Alkham-rd., u.t. 71½ yrs., g.r. 8*l.*, y.r. 45*l.* 315

Barnsbury.—10 and 11, Thornhill-sq., u.t. 38 yrs., g.r. 14*l.*, y.r. 96*l.* 680

By T. D. PEACEY.

Camden Town.—20, Camden-sq., u.t. 37 yrs., g.r. 10*l.*, e.r. 65*l.* 495

Contractions used in this list.—F.g.r. for freehold ground-rent; i.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. place; ter. for terrace; cres. for crescent; av for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

MEETING.

FRIDAY, AUGUST 9.

Edinburgh Architectural Association (*Architectural Exhibition*).—Mr. Ramsay Traquair on "The Church of Santa Sophia and the Imperial Mosques of Constantinople." The lecture will be illustrated by lantern views. 8.15 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 7 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 0	" " "
Picked Stocks for Facings	2 10 0	" delivered
Flettons	1 6 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	28 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "

	s. d.	
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Gremshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "
YORK STONE—*Robin Hood Quality.*		
Scappled random blocks.	2 10	" "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1¼ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks.	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super. "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "

SLATES (*continued*).

In. In.	£ s. d.	
20×10 best blue Portmadoc	12 12 6	per 1000 of 1200 at r. d.
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	" "
Do. Ornamental do.	60 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 "
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 "
Do. pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

BUILDING WOOD.	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	... 15 0 0
Deals: best 3 by 9	13 0 0	... 14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	... 12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less thn best.
Battens: seconds	0 10 0	" "
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	... 10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	... 9 10 0
Foreign Sawn Boards—1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
	At per load of 50 ft.	
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	... 5 0 0
Seconds	4 0 0	... 4 10 0
Small timber (8 in. to 10 in.)	3 12 6	... 3 15 0
Small timber (6 in. to 8 in.)	3 0 0	... 3 10 0
Swedish balks	2 10 0	... 3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	... 4 15 0
JOINERS' WOOD.	At per standard.	
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	... 25 0 0
3 in. by 9 in.	22 0 0	.. 23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	... 18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	... 20 0 0
" 3 in. by 9 in.	17 10 0	... 19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	... 14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	... 15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	... 12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	... 22 10 0
Do. 3 in. by 9 in.	18 0 0	... 19 10 0
Battens	13 10 0	... 15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	... 17 0 0
Do. 3 in. by 9 in.	14 10 0	... 16 0 0
Battens	11 0 0	... 12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	... 14 0 0
Do. 3 in. by 9 in.	12 10 0	... 14 0 0
Battens	10 0 0	... 11 0 0
White Sea and Petersburg—First white deals, 3 in. by 11 in.	14 10 0	... 15 10 0
" " 3 in. by 9 in.	13 10 0	... 14 10 0
Battens	11 0 0	... 12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	... 14 10 0
" " 3 in. by 9 in.	12 10 0	... 13 10 0
" " battens	10 0 0	... 11 0 0
Pitch-pine: deals	18 0 0	... 21 0 0
Under 2 in. thick extra	0 10 0	... 1 0 0
Yellow Pine—First, regular sizes	44 0 0	upwards.
Oddments	32 0 0	"
Seconds, regular sizes	33 0 0	"
Yellow Pine oddments	28 0 0	"
Kauri Pine—Planks, per ft. cube	0 3 6	... 0 5 0
Danzig and Stettin Oak Logs—Large, per ft. cube	0 3 0	... 0 3 6
Small " "	0 2 6	... 0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	... 0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	... 0 0 1
¾ in. do. do	0 0 7	... —
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	... 0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	... 0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	... 0 1 0
Teak, per load	17 0 0	... 22 0 0
American Whitewood Planks, per ft. cube	0 4 0	... 0 5 0
Prepared Flooring, etc.—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 6	... 0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	... 0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	... 1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	... 0 14 6

WOOD (*continued*).

JOINERS' WOOD (*continued*)—Prepared Flooring, etc. (*continued*)—	Per square. £ s. d.	£ s. d.
1 in. by 7 in. white, planed and matched	0 12 6	... 0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	... 0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	... 0 13 6
1 in. by 7 in. " "	0 14 0	... 0 18 0
¾ in. by 7 in. white " "	0 10 0	... 0 11 6
1 in. by 7 in. " "	0 12 9	... 0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	7 7 6	... 7 15 0
Compound Girders, ordinary sections	9 10 0	... 10 10 0
Steel Compound Stanchions	12 5 0	... 13 5 0
Angles, Tees, and Channels, ordinary sections	9 5 0	... 10 5 0
Flitch Plates	9 5 0	... 10 5 0
Cast Iron Columns and Stanchions including ordinary patterns	8 0 0	... 9 0 0

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Common Bars	8 10 0	... 9 0 0
Staffordshire Crown Bars, good merchant quality	9 5 0	... 9 15 0
Staffordshire "Marked Bars"	11 0 0	... —
Mild Steel Bars	9 10 0	... 9 15 0
Hoop Iron, basis price	9 15 0	... 10 0 0
" " Galvanised	17 10 0	... —

(*And upwards, according to size and gauge.)

Sheet Iron Black—Ordinary sizes to 20 g.	10 0 0	... —
" " 24 g.	11 0 0	... —
" " 26 g.	12 10 0	... —
Sheet Iron, Galvanised, flat, ordinary quality—Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16 0 0	... —
Ordinary sizes to 22 g. and 24 g.	16 10 0	... —
" " 26 g.	17 0 0	... —
Sheet Iron, Galvanised, flat, best quality—Ordinary sizes to 20 g.	19 0 0	... —
" " 22 g. and 24 g.	19 10 0	... —
" " 26 g.	21 0 0	... —
Galvanised Corrugated Sheets—Ordinary sizes 6 ft. to 8 ft. 20 g.	16 0 0	... —
" " 22 g. and 24 g.	16 5 0	... —
" " 26 g.	17 10 0	... —
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	... —
Best Soft Steel Sheets, 22 g. & 24 g.	14 0 0	... —
" " " 26 g.	16 0 0	... —
Cut Nails, 3 in. to 6 in.	10 15 0	... 11 5

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3lb. and up.	22 10 0	... —
Pipe in coils	23 0 0	... —
Soil pipe	25 0 0	... —
Compo pipe	26 0 0	... —
ZINC—Sheet—Vieille Montagne ton	33 0 0	... —
Silesian	32 15 0	... —
COPPER—Strong Sheet per lb.	0 1 4	... —
Thin "	0 1 5	... —
Copper nails "	0 1 3	... —
BRASS—Strong Sheet "	0 1 2	... —
Thin "	0 1 3	... —
TIN—English Ingots "	0 1 11	... —
SOLDER—Plumbers' "	0 0 9	... —
Tinmen's "	0 0 11	... —
Blowpipe "	0 1 1	... —

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d.	per ft. delivered.
" fourths	1⅞d.	" "
21 oz. thirds	3⅛d.	" "
" fourths	2⅜d.	" "
26 oz. thirds	4¼d.	" "
" fourths	3¼d.	" "
32 oz. thirds	5d.	" "
" fourths	4¼d.	" "
Fluted Sheet, 15 oz.	3⅛d.	" "
" 21 oz.	4¼d.	" "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d.	per ft. delivered.
¼ "	2½d.	" "
⅜ "	3d.	" "
Figured and Oxford Rolled "Oceanic" Glass, white	4d.	" "
Do. " tinted	5½d.	" "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 4
" " " in barrels	"	0 2 5
" " " in drums	"	0 2 7
Boiled " " in pipes	"	0 2 6
" " " in barrels	"	0 2 7
" " " in drums	"	0 2 8
Turpentine in barrels	"	0 3 6
" in drums	"	0 3
Genuine Ground English White Lead	per ton	27 0 0
Red Lead, Dry	"	24 10 0
Best Linseed Oil Putty	per cwt.	0 7 0
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0

VARNISHES, &c. (*continued*).	Per gallon £ s. d.
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TERMS OF SUBSCRIPTION.

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ALDERSHOT.—For reconstruction of the Crimea-road sewer, etc., for the Urban District Council. Mr. F. C. Uren, Surveyor, Aldershot:—

E. S. Crow	£193 10	W. Norris, Upper Hale, Farnham*	£143 10
Ripley, Strong, & Co.	180 0		

BISHOP'S STORTFORD.—For alterations at offices, 7, North-street, for the Urban District Council. Mr. R. S. Scott, A.M.I.C.E., Surveyor to the Council:—

J. Day	£140 0	A. I. Markwell.	
A. Franklin	119 0	Bishop's Stortford*	£97 10

BRIGHTON.—For painting, etc., to schools, etc., for the Education Committee. Messrs. T. Simpson & Son, Surveyors, 17, Ship-street, Brighton:—

Ditchling-road School.

Holloway Bros.	£98 12 0	Gates & Sons	£69 0 0
G. Tidey & Co.	94 10 0	Bell & Son*	67 13 6
J. Barnden	78 18 6	Olliver & Sons	60 13 0
Geering & Sons.	75 0 0		

[All of Brighton.]

Hanover-terrace School.

Hockley & Co.	£70 0 0	Gates & Sons*	£35 17 6
Bell & Son	43 13 0	Olliver & Sons	35 15 6
Geering & Sons.	39 10 0	J. Webb	19 7 6
J. Barnden	36 10 6		

[All of Brighton.]

Middle-street School.

J. Barnden	£140 0	Bostel Bros.	£105 0
Geering & Sons	120 0	Gates & Sons*	95 15

[All of Brighton.]

Pelham-street School.

S. Saunders	£89 0 0	Bell & Son	£63 7 6
Holloway Bros.	84 6 6	Olliver & Sons	58 10 0
Field & Co.	78 0 0	Gates & Sons	55 0 0
Geering & Sons.	70 0 0	J. Barnden*	53 10 0
G. Tidey & Co.	76 10 0		

[All of Brighton.]

St. Luke's-terrace School.

Geering & Sons	£79 10	J. Barnden	£69 10
Olliver & Sons	71 10	Gates & Sons*	57 10

[All of Brighton.]

Pupil-teacher Centre.

Field & Co.	£87 0 0	Bell & Sons	£58 12 0
G. Tidey & Co.	73 13 0	Gates & Sons	57 0 0
Geering & Sons	59 19 0	J. Barnden*	49 0 0
J. Webb	59 7 6		

[All of Brighton.]

No. 54, *Old Steine.*

J. Barnes & Sons	£36 0 0	Gates & Sons	£23 10 6
J. Barnden	34 0 0	Bostel Bros.*	21 0 0
G. R. Lockyer	31 10 0		

[All of Brighton.]

For repairs to tar-pavements:—

School.	Hobman & Co., London.	Constable, Hart, & Co., London.*	Benated & Son, Maidstone.
	£ s. d.	£ s. d.	£ s. d.
Ditchling-road	68 12 0	59 15 0*	80 12 0
Elm-grove	8 10 0	7 10 0*	17 0 6
Middle-street	2 0 0	2 10 0	2 5 6
Pelham-street	4 10 0	5 10 0	8 17 6
Queen's-park	59 18 0	67 8 0*	68 0 0
St. Luke's-terrace	28 12 0	26 0 0	47 0 0

[The repairs to the tar-pavements of the Middle-street, Pelham-street, and St. Luke's-terrace Schools to be carried out by the Borough Surveyor.]

Pelham-street School (*Electric Lighting*).

Bostel Bros.	£187 10 0	Gooding & Taylor	£128 10 0
Page & Miles	160 2 0	H. J. Galliers	123 0 0
Clifford, Hawkes, & Walton	149 12 0	Adams Bros.*	115 0 0

[All of Brighton.]

No. 16, *Dean-street* (*Repairs, etc.*).

Gates & Sons	£3 14 6	J. Webb*	£2 15 6
J. Barnden	3 7 6		

[All of Brighton.]

York-place Secondary School: Alteration of North Class-rooms, Boys' Department.

Holloway Bros.	£101 7 10	Sattin & Evershed	£85 0 0
G. R. Lockyer	86 15 0	J. Barnes & Son*	64 0 0

[All of Brighton.]

CARLISLE.—For erecting an infants' school, Norman-street, for the Education Committee. Messrs. Oliver & Dodgshun, FF.R.I.B.A., Lowther-street, Carlisle:—

Builder: J. Logan*	£2,640 4 0
Carpenters and Joiners: W. Baty & Sons*	1,746 0 0
Plumber: G. Sowerby*	400 0 0
Plasterers and Concreters: R. M. Ormerod & Son*	761 3 3
Painters and Glaziers: Ling & Mark*	103 15 5
Slater: J. T. Kellett*	160 0 0

[All of Carlisle.]

CHILTON.—For sewerage and sewage disposal, for Denebridge Chilton-buildings and Windlestone-row, for Sedgefield Rural District Council. Mr. J. Stones, engineer and surveyor, Sedgefield:—

R. Annakin, Harrogate*	£2,357 14 7

CULGARTH.—For erecting a schoolmaster's house, for the Trustees. Mr. J. Graham, architect, Bank-street, Carlisle:—

Mason: R. Sewell, Culgarth, Carlisle	£199 15 10
Joiner: J. Huidson, Culgarth, Carlisle	90 10 0
Painting, Glazing, Plastering, Slating, Plumbing: W. Kitchen, Penrith	117 10 0

DARTFORD (Kent).—For covering roofs with corrugated iron and for repairs and repainting at Long Reach Smallpox Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

M. McCarthy	£2,853	General Building Co.	£2,575
R. Wall	2 799	L. Kazak	2,505
J. McManus	2,700	W. Hussey, Albert Hall-mansions, S.W.*	2,490
W. Harbrow	2,625		

DENBURY (Devonshire).—For new cloak-room, alterations, and repairs at Council school, for the Devon Education Committee. Mr. Percy Morris, County Architect (Education), 1 Richmond-road, Exeter:—

Stevens Bros.	£189 3 0	R. E. Narracott	£172 10 0
A. C. Penevill & Son	179 10 0	F. J. Badcock, Ashburton*	151 18 3

[Architect's estimate, £130.]

ELMSCOTT (Devonshire).—For new drainage at Council school, for the Education Committee. Mr. Percy Morris, County Architect (Education), 1, Richmond-road, Exeter:—

Ridge & Prior	£244 0 0	Pethick Bros.	£128 16 7
Lee & Ellis	228 0 6	S. Cann, Hartland*	115 10 0
T. Lane	152 10 0		

[Architect's estimate, £132.]

EMSWORTH.—For erecting a private house in the South Leigh-road, for Mr. A. V. Blake. (Messrs. Hall, Pain, & Goldsmith, architects, 48, West-street, Fareham). Quantities by Mr. C. W. Ball, Whittington-chambers, King's-road, Southsea:—

A. G. Osenton	£1,455 0 0	H. Rubick	£1,227 13 9
C. Wright	1,417 0 0	J. Crockerell	1,192 0 0
H. W. Wiggins	1,316 0 0	F. J. Privett	1,187 0 0
H. Plummer	1,284 0 0	J. Munday	1,178 0 0
J. Lawrance	1,280 0 0	Scadgell & Son	1,044 0 4
W. T. Dugan	1,238 0 0	H. Munday, Havant*	1,029 6 9
A. H. Clear	1,230 17 10		

FROLESWORTH (Lutterworth).—For alterations to school. Mr. J. A. L. Beasley, architect and surveyor, 35, Friar-lane, Leicester. Quantities by architect:—

E. Haycock & Sons	£187 0	F. Sleath	£149 17
Broughton, Cox, & Co.	165 0	J. R. Cooke	147 0
J. W. Stanage	160 0	T. Lord & Son, Sharnford*	138 15
King & Ridley	157 0		

[Architect's estimate, £150 12s.]

GREAT MASSINGHAM.—For erecting four cottages, for the Marquis Cholmondeley Lodge of Oddfellows, Great Massingham, Norfolk (5142):—

J. Bone	£790 0	Chilvers	£560 0
J. Boddy	618 0	Lincoln	558 0
Riches	599 10	Barnes	550 0
Warne	581 0	Spragg, Grimston, Norfolk*	462 13
W. Hodson	567 10		
Medwell	560 0		

HITHER GREEN.—For granite sett paving and repairing certain roads at Park Fever Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

W. Pearce	£1,036 0 0	J. Mowlem & Co., Ltd.	£762 0 0
B. Martin	940 0 0	H. Woodham & Sons	748 0 0
W. Griffiths & Co., Ltd.	925 0 0	T. Wood & Sons, Crockenhill, Swanley, Kent*	723 2 3
Foy Bros.	890 19 5		
Grounds & Newton	812 0 0		

KINGSTON-ON-THAMES.—For erecting a gymnasium and public hall in the Penrhyn-road, for Mr. J. C. Huggett. Mr. A. Mason, architect and surveyor, Broughton-chambers, Victoria-road, Surbiton. Quantities by architect:—

J. & M. Patrick	£3,502 0 0	Sansom & Bishop	£2,975 0 0
Bull & Esdaile	3,300 0 0	A. Leather	2,943 0 0
F. Hawkey	3,280 0 0	Gaze & Sons	2,897 0 0
Compton Bros.	3,270 3 0	Moss & Co.	2,893 2 4
W. Richardson	3,239 0 0	J. Christie	2,882 0 0
A. E. Sims	3,150 13 0	J. Cassé	2,863 0 0
Collinson & Co.	3,149 0 0	A. Lawrence	2,862 0 0
Ide & Son	3,145 0 0	Limpus & Son	2,857 0 0
F. G. Minter	3,100 0 0	Webster & Son	2,839 0 0
Rice & Sons	2,998 0 0	W. Irwin, Islington	2697 0 0
McDonald Bros.	2,986 0 0		
G. Lacey	2,982 0 0		

LATCHINGDON.—For the construction of sewers, for Maldon Rural District Council. Messrs. Price & Bilsham, engineers, 52, Queen Victoria-street, E.C.:—

S. P. Wilson	£630 0 0	Buxton & Jenner	£525 0 0
W. Neil & Co.	627 0 0	Rogers & Wood	519 0 0
J. Parren & Son	590 0 0	H. Gurton	510 0 0
J. Rayner	580 0 0	J. C. Porter, London*	459 4 2
J. C. Thompson	573 0 0		

LITTLEHAMPTON.—For 254 yds. of cast-iron water main, etc., Berry-lane, for the Urban District Council. Mr. H. Howard, F.S.I., Town Offices, Littlehampton:—

Snewin Bros., Littlehampton*	£73 10

LLANSILIN.—For repairs, plastering, and painting to the Baptist Chapel, for the Baptist Church, Llansilin. Mr. Edward Jones, jun., architect, Oswestry:—

R. R. Morris	£124 10
R. Jones	115 10
Jones & Evans, Oswestry*	112 0

LLANISHEN.—For the extension of the Parish Church, Llanishen, Glam. Mr. H. Douglas Blessley, architect and surveyor, 22, Trinity-street, Cardiff:—

S. Shepton & Sons	£2,665	Blacker Bros.	£2,249
W. Williams	2,500	E. D. W. Evans	2,220
Stephens, Bastow, & Co.	2,489	J. H. Maggs & Co.	2,180
Knox & Wells	2,300	J. Allen & Sons	2,169
E. Turner & Sons	2,250	G. Beames, 16, Violet-row, Cardiff*	2,096

LONDON.—For painting and repairs to Trundley-road School, Deptford, for the London County Council Education Committee:—

W. Sayer & Son	£156 0 0	T. D. Leng	£116 0 0
W. Banks	139 14 6	E. Mills, Siebert Works, Westcombe-hill, Blackheath*	112 12 0
S. Musgrove	124 12 0		
W. Johnson & Co., Ltd.	124 0 0	W. J. Howie	102 0 0
W. Prior & Co.	123 0 0		
H. Groves	117 0 0		

LONDON.—For painting Somerford-street School, Bethnal Green, for the London County Council Education Committee:—

Messrs. Parrott & Isom	£443

[Messrs. Snewin Bros. & Co., whose tender was previously accepted on July 24 for the work, have withdrawn their tender.]

LONDON.—For erecting greenhouse and potting-shed at the South-Eastern Fever Hospital, New Cross, S.E., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

A. Allen	£352 10	Wrinch & Sons	£214 0
J. Harrison & Co.	241 0	G. W. Riley	205 0
D. Lowe & Sons	220 0	H. Line, 81, Peckham-rye, S.E.*	197 0
Stimpson & Chambers	215 0		

LONDON.—For repairs to dolphins at South Wharf, Rotherhithe, S.E., for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

J. Shelbourne & Co.	£885 0 0
W. C. Reeder & Co.	755 0 0
J. West & Son	665 10 0
G. C. Webb & Co.	653 2 6
Campbell & Handman	640 0 0
Chafen & Newman, Ltd., 96, Trundley-road, Deptford, S.E.*	603 0 0

LONDON.—For erecting boiler-house and workshops at the North-Eastern Fever Hospital, St. Ann's-road, Tottenham, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

Martin, Wells, & Co.	£6,130	Brand, Pettit, & Co.	£5,620
Patman & Fotheringham, Ltd.	5,998	Thomas & Edge	5,612
W. Reason	5,997	A. E. Symes	5,294
W. Johnson & Co., Ltd.	5,960	C. Dearing & Son	5,238
B. E. Nightingale	5,959	G. Munday & Sons	5,149
A. Fairhead & Son	5,759	E. Wall, Alice Works, Summerstown, S.W.‡	4,996
McCormick & Son	5,678		

‡ Subject to the sanction of the Local Government Board to the expenditure.

MEDDON (Devonshire).—For new drainage, etc., at Council school, for the Education Committee. Mr. Percy Morris, County Architect (Education), 1, Richmond-road, Exeter:—

Lee & Ellis	£182 18 6	Pethick Bros.	£124 11 0
Ridge & Prior	176 17 6	S. Cann, Hartland*	102 10 0
T. Lane	139 0 0		

[Architect's estimate, £113.]

MORETON-IN-MARSH.—For works at the Council school, for the Gloucestershire Education Committee:—

Epsley & Co., Ltd., Evesham*	£985

MORETON-IN-MARSH.—For erecting composite wood and iron buildings, for the Gloucestershire Education Committee:—

Epsley & Co., Ltd., Evesham*	£340

NOTTINGHAM.—For the Lewis Memorial Hall. Messrs. A. R. Calvert and William R. Gleave, A.R.I.B.A., 18, Low-pavement, Nottingham:—

W. Moule & Co.‡	£1,300

‡ Subject to variations.

[Lowest of ten tenders.]

NOTTINGHAM.—For house, Lucknow Drive, Mapperley Park. Messrs. A. R. Calvert and William R. Gleave, A.R.I.B.A., 18, Low-pavement, Nottingham:—

W. Appleby*	£1,562

[Lowest of eight tenders.]

ORESTON (Devonshire).—For new drainage, alterations to offices, etc., at Council schools, for the Education Committee. Mr. Percy Morris, County Architect (Education), 1, Richmond-road, Exeter:—

Stevenson & Co.	£241 0	Spencer & Coleman	£140 10
Steer & Pearce	200 0	J. Paynter	138 0
F. A. Trustcott	196 0	S. A. Elford, Oreston*	117 12
J. Davey	148 0		

[Architect's estimate, £160.]

PENRHIWCEIBER.—For erecting an institute, for Messrs. Nixon's workmen. Mr. T. W. Millar, architect, Mountain Ash:—

A. R. John	£2,000	T. W. Davies	£1,950
Davies & Co.*	1,974		

[All of Mountain Ash.]

RACKHEATH (Norfolk).—For proposed new school teachers' house, offices, fencing, etc., for the Educational Committee of the Norfolk County Council. Messrs. Lacey & Upcher, architects and surveyors, 6, Upper King-street, Norwich. Quantities by architects:—

F. R. Hipperson	£1,845 0 0	R. Watts	£1,473 11 0
G. E. Howes & Sons	1,590 0 0	R. Shanks	1,448 0 0
J. J. Howes	1,583 8 11	W. J. Hannent	1,435 0 0
C. W. Gunton	1,568 8 10	E. Haydon	1,426 8 3
J. Evans	1,559 16 6	A. S. Lincoln	1,420 0 0
O. Batchelor & Son	1,511 8 6	Podd & Fisher	1,408 0 0
T. N. Yelf	1,484 0 0	R. W. Riches, Postwick*	1,385 0 0
J. H. Mickleburgh	1,482 0 0	Jones & Sons	1,363 6 6

LONDON.—For hardwood paving of part of Northwold-road (adjoining St. Michael and All Angels' Church), for Hackney Borough Council. Mr. Norman Scorgie, Borough Engineer and Surveyor, Town Hall, Hackney, N.E. :—

	H. Hemming, 97, Sabott-road, Clapham Junction, S.W.	W. Griffiths & Co., Ltd.	Acme Flooring and Paving Co. (1904), Ltd.	Improved Wood Pavement Co., Ltd.*
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Excavate as necessary; sift and cart away old road metal and other material; provide and lay concrete foundation; provide and lay 9 in. by 3 in. by 5 in. Jarrah wood blocks; and finish complete. (Approximately 700 sup. yds.) Per superficial yard	0 17 9	0 17 6	0 17 2	0 17 2
Take up wood blocks from existing wood-paved crossing; refloat existing concrete foundation; clean old blocks and relay complete. (Approximately 35 sup. yds.) Per superficial yard	0 5 3	0 6 0	0 6 6	0 5 11
Extra excavation and cartage (if required). Per cubic yard	0 4 0	0 3 9	0 4 6	0 5 6
Extra concrete (if required). Per cubic yard	0 12 6	0 14 9	0 15 0	0 14 0
Extra floating material (if required). Per cubic yard	0 16 6	1 8 0	1 1 0	1 1 0

SALISBURY.—For laying cast-iron water-mains at the Workhouse, for the Guardians. Messrs. Harding & Son, architects, 58, High-street, Salisbury :—

Jenkins & Pinder, Market-place, Salisbury* .. £105

SCOLE.—For proposed new vestry to Scole Church, for the Rector and Churchwardens. Messrs. Lacey & Upcher, architects and surveyors, 6, Upper King-street, Norwich. Quantities by architects: —

F. Gray	£316 14 6	W. H. Ludkin	£237 5
Cubitt & Gotts	296 0 0	Tash & Langley	226 3
G. E. Hawes & Sons	246 0 0	J. Wade, Long Stratton*	225 12
J.H.Mickleburgh	242 0 0	H. A. Hipperson	225 0

SHERFORD (Devonshire).—For new cloak-room, coalstore, repairs, etc., at Council school, for the Education Committee. Mr. Percy Morris, County Architect (Education), 1, Richmond-road, Exeter :—

W. B. Shepherd	£185 10 0	J. P. Rhymes	£162 5 0
R. Tozer	179 0 0	R. Lakeman	161 10 0
W. Perrett	176 10 0	J. W. Mitchell, Sherford*	160 10 0
R. Moore	169 12 6		
J. H. Brooking	167 0 0		

[Architect's estimate, £170.]

SHUTE (Devonshire).—For repairs, ventilation, painting, drainage, etc., at Council school, for the Education Committee. Mr. Percy Morris, County Architect (Education), 1, Richmond-road, Exeter :—

Pulman & Sons	£395 15 0	Enticott & Son, Axminster*	£294 2 1
W. B. Parsons	388 4 6		
C. Turner	317 13 3		

[Architect's estimate, £328 18s. 4d.]

STORNOWAY.—For erecting new post-office, for the Commissioners of H.M. Works and Public Buildings :—

		Credit.
Scott, Morton, & Co.	£5,850 0 0	£55 0 0
Ross & McKenzie	4,929 0 0	92 0 0
Mackenzie & Macleod	4,849 8 11	170 17 6
S. Ranger	4,770 0 0	75 0 0
W. Macdonald	4,563 1 5	70 18 0
J. Robertson	4,474 10 0	108 2 0
T. M. Donald	4,455 0 0	80 0 0
D. Macandrew & Co.	4,346 0 0	120 0 0
J. Macrae	4,329 0 0	111 0 0
H. Mackinish	4,288 4 0	66 1 8
J. Campbell	4,250 0 0	77 0 0
A. & R. Dunbar	4,180 0 0	84 4 5
J. Adam & Co.	4,061 0 0	80 0 0
R. Maclennan	4,021 6 11	104 1 5
W. Maclean*	3,974 14 10	104 1 5
J. Lawrence‡	2,598 0 0	46 13 9

‡ Mason, excavator, and brickwork only.

TOOTING GRAVENEY.—For repairs to tar-paving, etc., at the Fountain Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief :—

Potter & Co.	£242 0	Chittenden & Simmons, Ltd.	£131 18
H. Woodham & Sons	235 0	J. Wainwright & Co., Ltd., 173, Maida Vale, W.*	122 7
J. Smart & Son	179 0		
Grounds & Newton	170 0		
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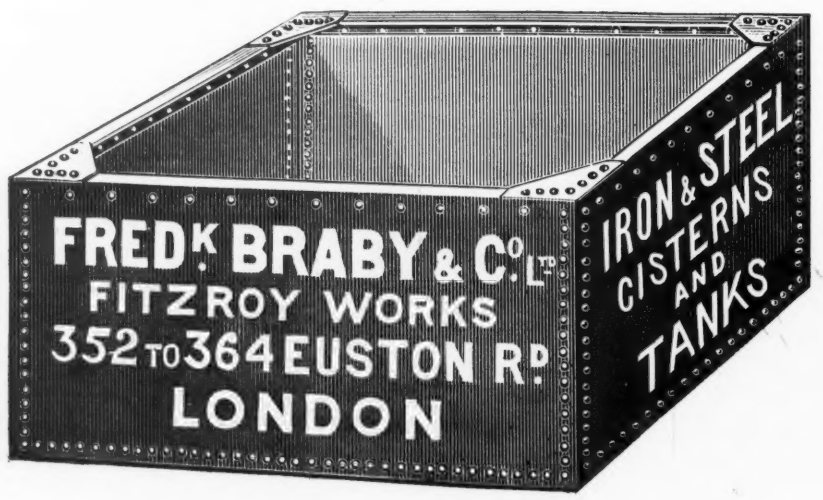

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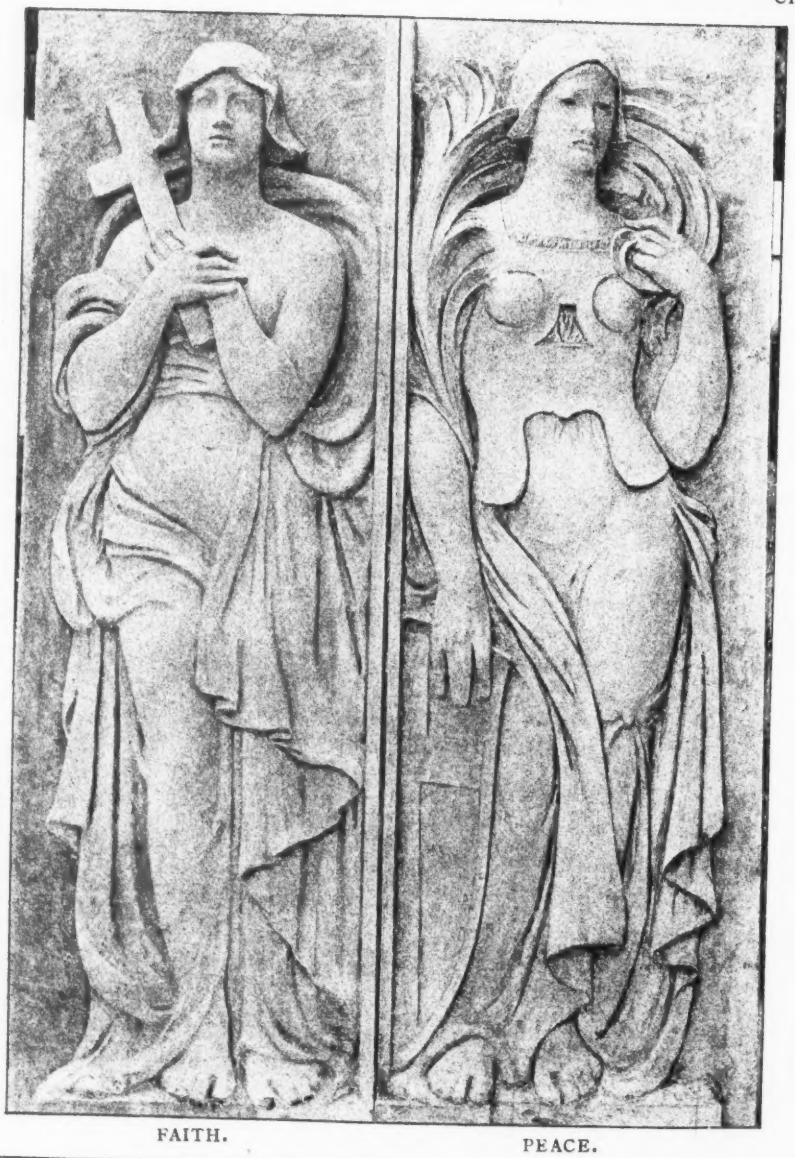

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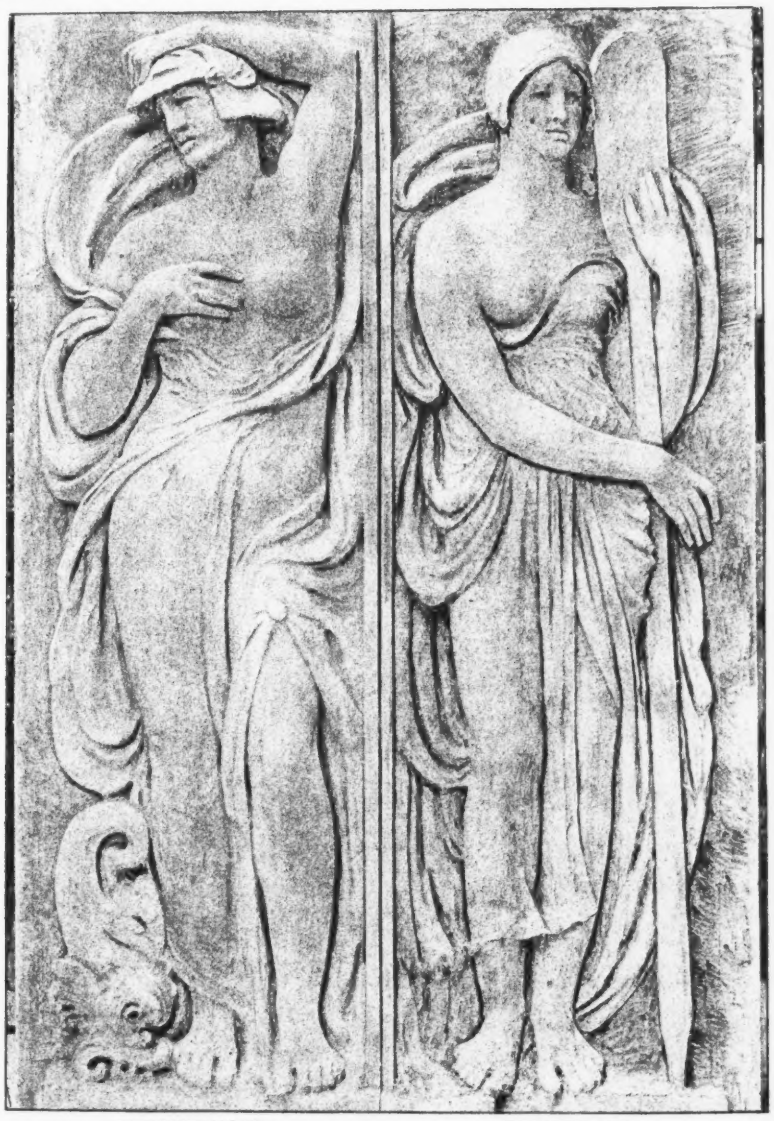

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NOTE
THIS GATE WHICH IS PERFECT EXCEPT FOR A FEW LEAVES, IS CLOSE TO CHISWICK PARISH CHURCH, AND WAS PROBABLY MADE ABOUT AND THERE BEING SEVERAL SIMILAR EXAMPLES OF THAT DATE.
IT IS PERPENDICULAR IN SECTION AT THE LOCK BUT SLIGHTLY OUT AT THE HINGE. NEARLY ALL THE VERTICAL BARS ARE ALSO OUT, ONE OR TWO BEING BENT AND ALL VARYING IN SIZE.
BOTH SIDES HAVE BEEN MEASURED AS HARDLY TWO PARTS ARE THE SAME SIZE.

ELEVATION

STONE WALL

STEP

SECTION

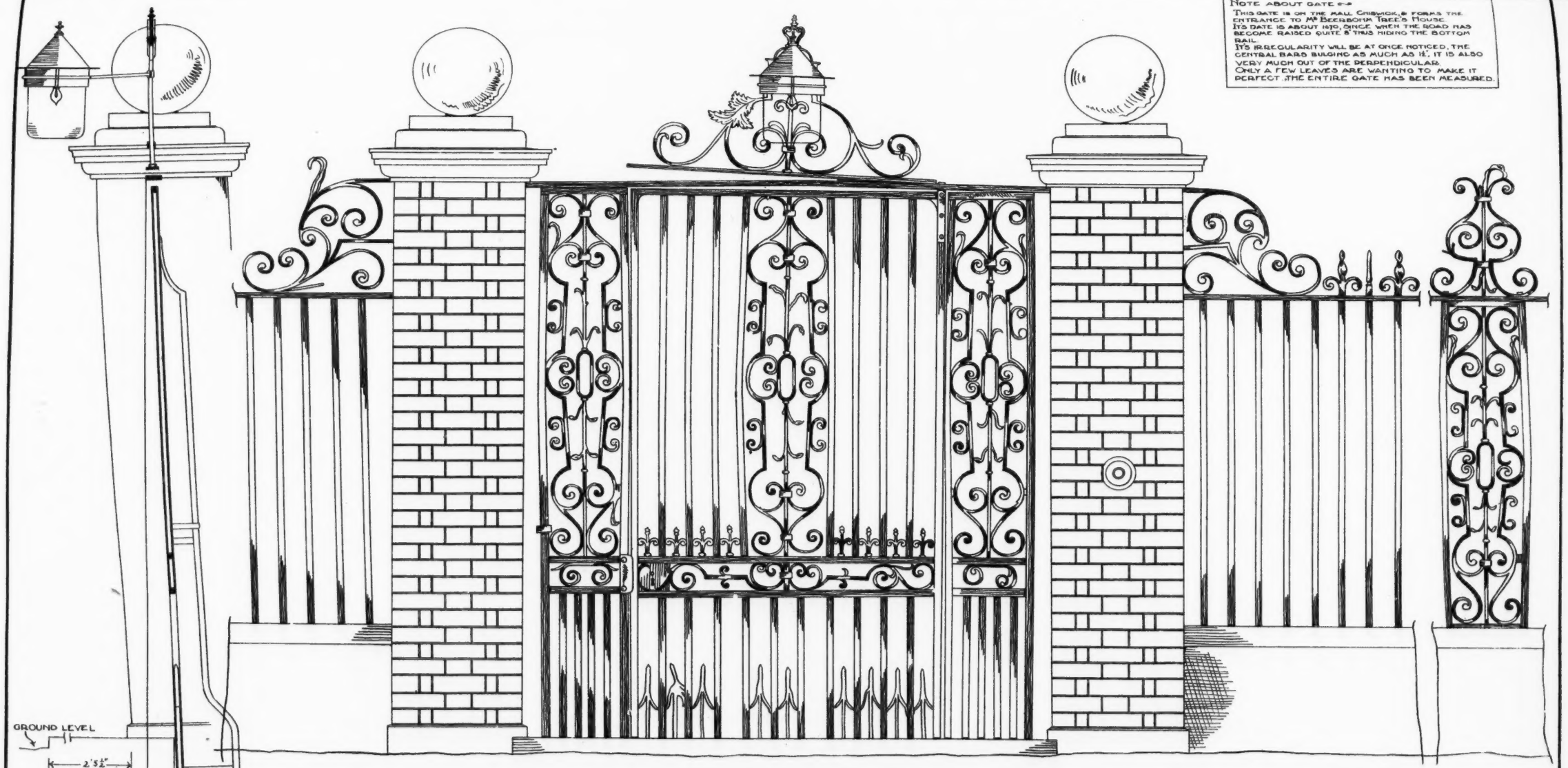
PLAN

SCALE. INCHES 0 3 6 9 12 1' 3' 6' 9' 12' 15' 18'

NOTE ABOUT GATE 6-4
THIS GATE IS ON THE MALL CHISWICK, & FORMS THE ENTRANCE TO MR BEERBOHM TREE'S HOUSE.
ITS DATE IS ABOUT 1670, SINCE WHEN THE ROAD HAS BECOME RAISED QUITE 8' THUS HIDING THE BOTTOM RAIL.
ITS IRREGULARITY WILL BE AT ONCE NOTICED, THE CENTRAL BARS BULGING AS MUCH AS 12", IT IS ALSO VERY MUCH OUT OF THE PERPENDICULAR.

NOTE ABOUT GATE &c.

THIS GATE IS ON THE MALL CHISWICK, & FORMS THE ENTRANCE TO MR BEERBOHM TREE'S HOUSE.
ITS DATE IS ABOUT 1670, ONCE WHEN THE ROAD HAS BECOME RAISED QUITE 8" THUS HIDING THE BOTTOM RAIL.
ITS IRREGULARITY WILL BE AT ONCE NOTICED, THE CENTRAL BARS BULGING AS MUCH AS 1½", IT IS ALSO VERY MUCH OUT OF THE PERPENDICULAR.
ONLY A FEW LEAVES ARE WANTING TO MAKE IT PERFECT. THE ENTIRE GATE HAS BEEN MEASURED.



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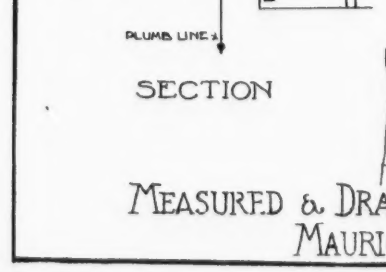

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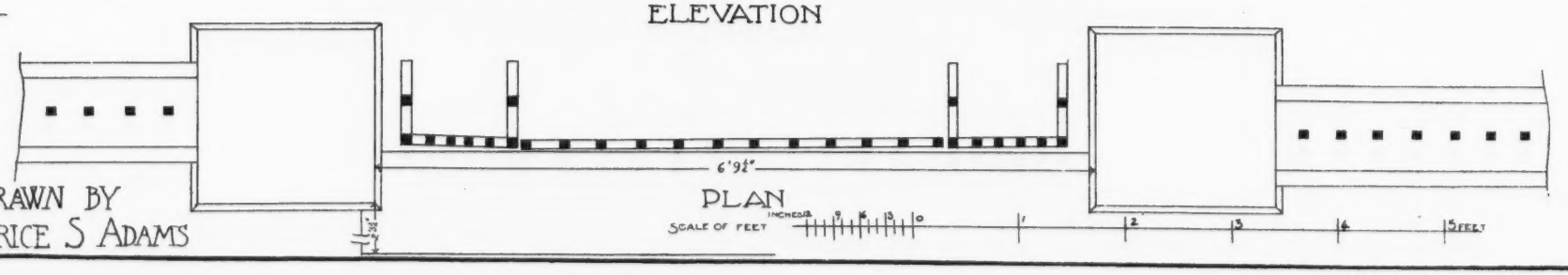

PLAN

SCALE OF FEET

MEASURED & DRAWN BY
MAURICE S ADAMS

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